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11 September 1985

Worldwide Report

**NUCLEAR DEVELOPMENT
AND
PROLIFERATION**

FBIS

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11 September 1985

WORLDWIDE REPORT
NUCLEAR DEVELOPMENT AND PROLIFERATION

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TAIWAN

NUCLEAR PLANT REPAIRS TO TAKE LESS THAN YEAR

OW250251 Taipei CNA in English 0243 GMT 25 Jul 85

[Text] Taipei, 24 Jul (CNA)--The repair work on the damaged generator at the third nuclear power plant in southern Taiwan is expected to be completed within one year, said Chou Chin-hun, director of the plant.

Chou made the estimate Wednesday afternoon while briefing officials with the Ministry of Economic Affairs on the possible cause of the accident.

He pointed out that the dismantling of the damaged equipment has been completed and that Taipower and General Electric personnel have begun to study how to repair the damaged generator.

According to a preliminary estimate, the repair work will be completed in less than one year, Wang said.

On the other hand, Chen I-tien, deputy director of the plant, made public a detailed list of the damaged parts, which include the blades of the first and second low pressure turbine compressors. Most parts of the generator are still in good condition and do not have to be replaced, he said.

Meanwhile, an official with the Atomic Energy Council stressed that the accident at the 3d nuclear plant is by no means a "nuclear incident" as some people have worried because a similar accident could have happened in any power plant in the world energized by traditional fuels.

The Taiwan Machinery Manufacturing Corp, Lien Ya Electronics Corp, China Steel Corp, and China Shipbuilding Corp have announced that they are willing to provide all necessary assistance to help Taipower repair the damaged generator.

CSO: 5100/4135

TAIWAN

BRIEFS

TAIPOWER ON NUCLEAR PLANT DAMAGE--Taipei, 5 Aug (CNA)--General Electric has recently completed collecting the information on the main shaft of the first generator at the third nuclear power plant which broke down in July, and is examining the concerned data to see if the damaged generator is reparable, an official with the Taiwan Power Company said Monday. This official pointed out that the G.E. shipped here a set of highly-sophisticated equipment last Thursday in order to find out if the accident had caused irreparable damage to the main shaft of the first generator. G.E. has collected all the information it needs and is analyzing the concerned data to see if the generator can be salvaged, he said. If the examination proves that the main shaft did not curl and is still useable, the loss incurred from the accident will be reduced to the minimum, the official said. It will cost 40 million U.S. to buy a new generator if the damaged generator is irreparable, he added. Taipower has been informed that some major components, including the compressor blades of the high pressure turbine and part of the control equipment will have to be replaced, the official said. [Text] [Taipei CNA in English 0324 GMT 6 Aug 85 OW]

TAIPOWER, GE PLANT DAMAGE DISCUSSION--Taipei, 6 Aug (CNA)--The Taiwan Power Company has completed collecting information on the recent fire incident at its third nuclear power plant. Results of the investigation have proved that there were no personal failings in the accident. Chu Shan-tseng, vice president of and spokesman for Taipower, said Tuesday that Taipower will soon hold talks with the General Electric Corp to discuss who should be responsible for the accident and questions related to compensation. As to the condition of the main shaft of the first generator, Chu said it has been warped a little but has a good chance of being repaired. [Text] [Taipei CNA in English 0231 GMT 7 Aug 85 OW]

NUCLEAR PLANTS CONSTRUCTION OPPOSITION--Taipei, 11 Aug (CNA)--Most people in this nation held that nuclear power plants would affect the ecological balance if precautions are not taken, saying that they hope the Taiwan Power Company will stop building more nuclear power plants, according to a public opinion survey conducted by the Republic of China Jaycees. The ROC Jaycees recently interviewed 3,122 persons, of which most are well-educated people, and asked their opinions on some questions related to the nation's ecological environment. Of the 3,122 persons interviewed, 40 percent said nuclear

power plants would seriously affect ecological balance if preventive measures are not taken, while 43 percent said nuclear power plants would produce some adverse influence on the environment under the same conditions. The respondents asked the government not to build nuclear power plants purely based on the consideration of economic interests. They also suggested that the government be more resolute in maintaining ecological balance and imposing heavy punishment in those who violate the environmental protection laws. [Text] [Taipei CNA in English 0244 GMT 12 Aug 85 OW]

CSO: 5100/4135

CANADA

CONCERN VOICED OVER U.S. NUCLEAR WASTE DUMP PLAN

Ottawa THE CITIZEN in English 12 Jul 85 p A4

[Text]

WASHINGTON (CP) — Canadian government officials lodged expressions of "deep concern" Thursday about the possibility of the United States building a permanent underground nuclear waste dump near the Central Canadian border.

About one-tenth of 236 areas the U.S. is considering for a permanent nuclear dump in the Eastern United States are close to the Canadian border. More than 20 sites border Quebec, Ontario and Manitoba.

U.S. officials offered "a broad assurance" that they would live up to their obligations to Canada and intend to choose sites that will not jeopardize the environment or human safety, Stan Gooch of External Affairs said in an interview.

Gooch, director of the Canada-U.S. transboundary division of the External Affairs Department in Ottawa, led a delegation of six government officials at a meeting with about 20 U.S. officials from the State Department, the U.S. Energy Department and the U.S. Environmental Protection Agency.

Gooch said maps officials have seen show more than 20 sites not far from Canada, including many in the rocks of the Laurentian uplands. The Canadian delegation singled out sites in Vermont, near drinking water for populated areas of Quebec, in making their case.

Quebec residents, alarmed by the prospect, have joined Vermont citizens in recent protests against a dump. They fear pollution of their drinking water. Five of nine potential sites in Vermont are near the border.

Gooch said the Canadians emphasized the federal government's "firm opposition" to a dump that could pose threats to Canada and invoked a list of obligations the United States is committed to follow.

Chief among them are the 1909 Canada-U.S. Boundary Waters treaty and the 1978 Great Lakes Water Quality Agreement which pledge both countries to refrain from polluting the other's water. International agreements were also mentioned.

In giving a broad assurance

that the United States will honor obligations to Canada, Gooch said the U.S. officials "went about as far as they could in this meeting."

The U.S. government plans to issue a draft short list of 20 sites selected from the 236, in November. Gooch said Canadian officials will meet U.S. officials again in September to discuss the issue and were promised that Canadians will be consulted throughout the decision-making process.

The United States is looking for permanent underground disposal sites for 40 years of accumulated nuclear waste from power plants, medical facilities and other users. There is an estimated 70,000 tonnes of nuclear waste now stored temporarily across the country.

The first permanent site is to be in the western U.S. and is supposed to be chosen in 1990 with operations beginning in 1998. The second site is to be in the east and that is the one causing concern in Canada. The second site is expected to be chosen after the turn of the century.

CANADA

CONTRACT FOR REACTOR SALE TO TURKEY NOT YET SIGNED

Toronto THE GLOBE AND MAIL in English 6 Jul 85 p B2

[Article by Brian Milner]

[Text]

Atomic Energy of Canada Ltd. has not yet reached agreement on a \$1-billion reactor deal with Turkey, despite a statement from Ankara that the contract has been awarded.

Talks with Turkey "have reached a very satisfactory level of negotiations, but no contract has been signed yet," an AECL spokesman said.

A report from the Turkish capital yesterday said an AECL-led consortium had won a

contract to build the Akkuyu-1 nuclear power station in southern Turkey. The consortium includes a British company, which would build a conventional power plant nearby, and Enka Holding, a Turkish contractor.

The stumbling block to the unusual venture remains financing. The power plant would be operated for the first 12 years by a company set up by the consortium and the state-owned Turkish Electric Authority. The reactor builders would have to

recover their investment from the sale of power from the plant.

The Turkish Government came up with the plan of having would-be power plant sellers — both thermal and nuclear — finance, build and operate the plants as a means of adding badly needed electricity production without placing a major strain on scarce reserves.

AECL and its original competitors for the deal had been without a firm order since the 1970s and were in no position to reject the

plan, provided they could come up with the necessary financing.

AECL's main rival for the Turkish deal was Kraftwerk Union AG, a unit of Siemens AG of West Germany. Turkish officials said plans for a second reactor at the Akkuyu-2 site have been suspended following Kraftwerk's withdrawal from the project.

When it is completed, the AECL portion of the deal will be worth \$800-million and provide 43,000 man-years of work for Canadian contractors.

CSO: 5120/21

CANADA

1984 URANIUM OUTPUT INCREASED BY ALMOST 50 PERCENT

Toronto THE GLOBE AND MAIL in English 10 Jul 85 p B16

[Text]

OTTAWA — Canada increased its uranium production by almost 50 per cent last year to capture more than a quarter of the non-Communist world's production.

Canada produced 10,790 tonnes of uranium in 1984, more than triple the amount its mines yielded a decade earlier, a British Petroleum review of world energy use recently reported.

Production by Canada, the United States, Australia and South Africa accounted for more than 60 per cent of total uranium reserves.

While Canada was the world's biggest uranium exporter last year, its reserves are

dwarfed by those of its competitors.

Canada has about 414,000 tonnes of total reserves, compared with 490,000 tonnes in the United States, 460,000 tonnes in South Africa and 1.2 million tonnes in Australia.

While Canada is in the top rank as producer of fuel for nuclear power, it stood sixth in nuclear-power generation, behind the United States, France, Japan, the Soviet Union and West Germany.

While total world consumption of primary energy increased 3.7 per cent in 1984 compared with 1983, nuclear-power consumption climbed by 17.4 per cent, the greatest increase for any fuel. The report did not include wood, peat and other such fuels in its calculations.

Canada accounted for 2.9 per cent of total oil production last year, 4.5 per cent of natural gas production, 1.7 per cent of coal production and 12 per cent of hydro-electric production.

CANADA

CHALK RIVER REACTOR RESUMES OPERATION AFTER SHUTDOWN

Fuel Rod Failure

Ottawa THE CITIZEN in English 11 Jul 85 pp A1, A20

[Article by April Lindgren and Kathryn May]

[Text]

One of four active nuclear reactors has been shut down at the Chalk River Laboratories following a radiation accident Wednesday that confined 1,500 employees inside the plant for four hours.

The employees were told to stay inside buildings from about 10:30 a.m. until 2:40 p.m. after a fuel rod failed at one of the experimental reactors.

The failure resulted in the release of small amounts of radioactive particles and gases, said Hal Tracey, the plant's public relations officer.

The confinement of plant workers, signalled by an alarm, was the longest in the plant's history, but the amount of radioactive substances leaked on to the ground and into the air was "really small potatoes," said Tracey.

"It's really just barely above background levels, and much below" the levels that would have required alerting people living near the plant, Tracey said.

Chalk River is a village of about 1,000 people, about 250 kilometres northwest of Ottawa.

Confinement orders have been issued at the nuclear plant in the past, but only about once every five years, and the stay-in period has never exceeded about two hours, said Tom Egan, spokesman for the Labor Alliance union.

The union represents about 500 nuclear operators and firemen as well as the workers who will be involved in the cleanup.

Egan said he was unaware of any employees being contaminated in Wednesday's

incident and "we're all going to report for work as usual with no strings attached," he said.

Clarence St. Jean, spokesman for about 580 tradesmen in the Atomic Energy Allied Council of Unions, said workers were getting worried after a few hours of being confined to the buildings.

"We've had practice sessions where you get an alarm telling people to stay in. But this time, when it got to be two or three hours, then people started to get concerned about what was going on," he said.

When the alarms finally stopped, workers not involved in the cleanup were sent home early.

Tracey said it was "unlikely" any employees were exposed, judging from the readings taken on instruments.

The emergency occurred when a fuel rod in the reactor failed. The cause of the failure has not been determined.

The fuel rod, which contains uranium oxide, acts as the reactor's source of heat.

When the aluminum sheath surrounding the uranium broke, there was a release of radioactive particles, which seeped out under the doors on to the ground.

Radioactive gas streamed out of the reactor's smoke stack for about a minute before the unit was shut down, and water used to cool the fuel rods was also contaminated.

Tracey said the contaminated ground around the reactor has been barricaded to keep employees out of the area.

Monitors in the smoke stack and scattered around the plant indicated the radioactive gas levels were well below the limits that would have required alerting people in the surrounding area, he said, noting that the plant is about eight kilometres inside the main gates.

The contaminated water was contained in holding tanks and was not released into the Ottawa River, he said.

Gordon Edwards, spokesman for the Montreal-based Canadian Coalition for Nuclear Responsibility, said "Any time you have an accident in which radioactive materials escape, it is serious.

"There is a tremendous amount of radioactive material in one fuel rod — the questions are how much of it escaped, how many people were contaminated and to what extent?

"This is a serious event, but not as serious as if you'd had massive fuel failure," he said.

Tracey said officials have yet to determine the total amount of

radiation released but said it was well below the guidelines set by the Atomic Energy Control Board for atomic workers.

Employees wear badges that detect whether they've been exposed to radiation and these badges are being examined to determine whether anyone was overexposed.

The board has set an exposure limit of three rems for workers every three months. The yearly exposure limit is five rems.

The failed fuel rod will be replaced and the reactor should be back in operation in about a week if all goes well, Tracey said.

The reactor, built in 1947 and used now for research experiments and to produce radio-isotopes for medical and industrial use, was involved in one of the world's first major nuclear accidents in 1952.

In that instance, a power surge due to a combination of mechanical and human errors, led to a series of explosions that severely damaged the core of the reactor.

Reactor Back in Operation

Toronto THE GLOBE AND MAIL in English 22 Jul 85 p 10

[Text]

CHALK RIVER, Ont. (CP) — The nuclear research reactor at Chalk River Laboratories has resumed normal operation after it was shut down following a radiation accident that confined about 1,500 employees to the plant for four hours.

Laboratory officials say only the handful of employees who were involved in the cleanup and repairs after the fuel-rod failure on July 10 were exposed to radiation and their exposure was well below the standard two-week level allowed by the Atomic Energy Control Board.

All the contaminated liquid efflu-

ent that escaped during the incident was contained in a holding tank at the time of the incident. The contaminated liquid was cooling water that flowed over the broken fuel rod to carry away heat.

The water was released into the Ottawa River on July 13 after the radioactivity dissipated and met the levels set for public safety. The reactor resumed normal operations the same day.

The release of the water is not considered to be hazardous, but the river continues to be monitored by Health and Welfare Canada and Atomic Energy of Canada Ltd.

CSO: 5120/21

CANADA

DOCUMENTS CAST DOUBT ON NUCLEAR REGULATORS' OBJECTIVITY

Ottawa THE WEEKEND CITIZEN in English 6 Jul 85 p B5

[Article by Margaret Munro]

[Text]

Ten years ago Canada's nuclear regulators secretly told the prime minister they were incapable of doing their job.

Funding and manpower problems, revealed in previously secret Atomic Energy Control Board documents obtained by Southam News, were so "serious" that board president Dr. Alan Prince threatened to resign in 1976.

Prince stayed on as head of the five-member board that oversees operation of the federal nuclear regulatory agency when the government promised more money, staff and revamped legislative powers.

He retired in 1978, after a long and unsuccessful battle for new legislation that would have made the board a more open, capable agency.

The board, now run by Jon Jennekens, actively rejects criticism about its secretive, technocratic past. It also disagrees with claims, like those made in Southam News stories in March which were based on minutes of board meetings held between 1980 and 1983, that the AECEB has helped promote and had trouble controlling the nuclear industry it regulates.

But more board documents, obtained for Southam News by Ottawa researcher Ken Rubin, clearly show that the board helped pro-

tect the nuclear industry.

They also reveal that the country's nuclear regulators were stretched far beyond their limits at a time when careful scrutiny of nuclear developments was "urgently" needed.

These documents cover board meetings between March 1975 and April 1978 when the agency was grappling with widespread radioactive contamination in Port Hope, Ont., and Uranium City, Sask.; political fallout from the Canadian uranium cartel; growing concern over radiation exposure to uranium miners; the country's rapidly expanding nuclear reactor program and the proliferation of small-scale radiation users across the country.

The period ends with the nuclear-powered Soviet satellite COSMOS-954 scattering its radioactive remains across the Canadian north.

It was a time when the board was so under-staffed and under-financed that nuclear inspectors had trouble travelling to the site of the latest problem.

At a September 1975 meeting, the board drafted a resolution directing Prince to plead with the federal energy minister for a 30-per-cent increase in the board's staff of 96.

"Recent developments in the areas of safeguards, uranium mining, radioactive waste manage-

ment, nuclear fuel processing and radioisotopes have placed additional and essential demands on AECEB staff and financial resources ... current levels of such AECEB resources will not realistically permit the effective execution of these demands," the documents state.

By July 1976 — when the investigation in Port Hope was turning up 10 to 12 homes and buildings a week contaminated with wastes from Eldorado Nuclear's wartime refinery operations — the situation was so bad Prince demanded 40 per cent more staff and threatened to resign.

In a letter sent through the energy minister to then prime minister Pierre Trudeau, Prince outlined the "very serious and urgent matter" and said he could not continue as president "unless a clear mandate and adequate resources were forthcoming."

The retired Prince now describes the period as "sort of a Mission Impossible" for the board.

"We had no capability for field work, or for enforcing what we were supposed to be enforcing," he said in an interview from his home just outside Ottawa. "So I ... simply advised the government that if they wanted to have a control board they better give it the ability and where-with-all to do the job."

The board was eventually al-

lowed to double in size, but the legislation Prince fought for died when the Liberal government fell in 1978 and has never been revived.

The demise of the legislation was unfortunate, he says, because the proposed law called for an expanded and more open regulatory process that might help the public sort through the "crazy kaleidoscope of misinformation" provided by the media and anti-nuclear "subversives."

Judging from the board documents, some of the abuse hurled at the AECB by the anti-nuclear "subversives" has been justified.

The documents show the board propping up its public image with news releases about positive aspects of nuclear technology but keeping quiet about radiation-related transport accidents and reactor licensing problems.

The minutes of an October 1976 meeting talk of "sincere doubts" about the effectiveness of safety systems of reactors at Pickering and Bruce. The systems are needed to prevent widespread contamination in the event of a major accident.

The members of the board discussed halving the power output of the Pickering reactors near Toronto on safety grounds.

"The probable effect of this on public support for the nuclear program must be recognized," the minutes note.

Minutes of the next meeting in December 1976 reveal pressure from Ontario Hydro to turn on the new reactors of the Bruce plant on Lake Huron even though all AECB's safety requirements had not been met.

The board members had "real concern that the problems over licensing should become public knowledge."

They worried that their go-ahead for the reactors could not be justified before a public inquiry but were also concerned

that "stubborn insistence" on all safety features "may not be justifiable on economic grounds."

The Bruce reactors were allowed to go into service with an "inadequate" emergency core cooling system, which might be compared to the emergency brakes on a car. The system is just now revamped to meet AECB's 10-year-old request for improvements.

In March 1977, the members decided it was wise for board staff to participate in the raging debate over nuclear power and technology.

They "emphasized that the board should be seen to be neutral on questions of public concern, independent of nuclear proponents and opponents and thoroughly competent to deal with the technical issues."

"The public must be convinced that each application for use of nuclear materials is carefully and rigorously examined," the minutes state.

The documents, however, refer to nagging concerns about the proliferation of radioactive devices, ranging from potent radiography cameras used on pipeline projects, to slightly radioactive devices such as smoke detectors and luminescent wristwatches.

Board member Dr. William Schneider, president of the National Research Council at the time, expressed concern "about the gradual trend, by small justifiable increments, towards an ever more radioactive environment."

Serious problems involving the misuse of radiography equipment also bothered some board members, but a lack of resources prevented the agency from doing much about until years later. The board, however, showed little hesitation in licensing more and more small-scale radiation users even though its compliance and inspection services were inadequate.

quate.

Only after several serious over-exposures to radiography workers did the board move to more actively monitor the hundreds of devices in use and improve training procedures for workers.

Current AECB President Jon Jennekens and his predecessor Alan Prince today scoff at suggestions that the agency was too accommodating to the nuclear industry it is meant to be regulating. They argue that the industry has long complained about costly over-regulation.

But early in 1978, the board was criticized by one of its most senior staff advisors, John Beare, for bowing to demands from Ontario Hydro which was busy building nuclear reactors.

Hydro officials had met with the board in October 1977 and convinced the five members to overrule their own staff's demands for an "expensive and time-consuming" safety modification at the Bruce nuclear plant.

Beare admonished the board at their next meeting in January 1978 for making such a decision "out of context." He said the board's hasty decision "may further aggravate the emergency core cooling system problem" at Bruce.

He then went on to express "his concern with the continuing erosion of safety margins" for nuclear reactors.

Jennekens says the incident does not mean the board was bowing to pressure from Hydro. It was, he says, a case where the board decided Hydro was right and the board staff was wrong.

He points to "the excellent safety record of the nuclear industry" as proof the decision was justified.

And Prince looks back on his three years at the board "with no regrets."

CANADA

AECL RECORDS PROFIT DESPITE NUCLEAR SALES DECLINE

Toronto THE TORONTO STAR in English 4 Jul 85 p E3

[Text]

OTTAWA (CP) — Crown company Atomic Energy of Canada Ltd. recorded its fourth straight year of declining revenue last year but managed anyway to show an increase in profit.

The 16.5 per cent drop in revenue reflects the general malaise in the nuclear industry as Ontario Hydro and foreign customers wrap up their reactor construction programs.

"The continued slow growth in both national and international utility expansion coupled with a sluggish economy have challenged the corporation in this period as it has never been challenged before," chairman Robert Despres and president James Donnelly said in AECL's annual report, released yesterday.

Since 1981, AECL's revenue has been pared in half.

Revenue from commercial operations was \$309 million in the fiscal year ended March 31, down from \$370 million in 1983-84.

Staff reduced

But, as the company cut costs and laid off staff to match the fall in business, net profit rose to \$9.8 million from \$8.9 million.

A drop in income from sales of Candu reactors was responsible for the over-all reduction in reve-

nue. Revenue from the supply and servicing of Candu reactors fell 25 per cent to \$146.3 million.

Because of the shutdown of two Ontario Hydro reactors at Pickering, in which AECL holds an interest, it received no income from that source.

Change ways

Donnelly has said the nuclear industry will have to change the way it does business if it is to survive.

One proposal would see the formation of a new National Nuclear Corp. to handle all aspects of designing, selling and building Candu reactors — functions now divided between AECL, Ontario Hydro and companies in the private sector.

AECL also plans to sell its radiochemical division, which last year recorded revenue of \$82.5 million, up from \$80 million in 1983-84. The division produces products for industry and health care.

As new orders for cancer therapy machines drop, AECL said it is concentrating on sales of radioisotopes and industrial products such as those used to irradiate food to prevent spoiling. It is the world's largest supplier of a number of radioactive chemicals used in industry and medicine.

CANADA

GREENPEACE SPOKESMAN CHARGES URANIUM SHIPMENTS UNREPORTED

Vancouver THE SUN in English 10 Jul 85 p D12

[Article by Debbie Wilson]

[Text]

Shipments of weapons-grade uranium are moving through Vancouver in "flagrant contravention" of the city's official nuclear weapons-free status, a spokesman for the Greenpeace Foundation charged Tuesday.

Greenpeace national director and nuclear researcher John Willis said at least one shipment of weapons-grade uranium has "fallen through the cracks" and gone unreported through the city's monitoring procedures for nuclear materials.

Willis said a May 14, 1984, shipment of 1.4 kilograms of high-grade "uranium fuel elements," was transported from the airport to Vancouver harbor and a ship destined for Japan, but has not appeared on any reports to city council.

"This shipment, in particular, is a flagrant contravention of council's ban on the transportation of components of the bomb."

Willis said Greenpeace will appeal to the city council standing committee on economic development Thursday to pursue tighter controls on the transport of high-grade uranium through the city.

Greenpeace plans to submit to the committee its report on nine shipments of uranium products that have been in Vancouver in the past 18 months, culled from the same dangerous goods permits issued by the Vancouver harbormaster that the fire chief uses to identify hazardous cargo.

Fire Chief Norman Harcus must report to the city manager the movement of all "fissile nuclear materials."

His annual report, which also goes to the economic development committee Thursday, notes three shipments of radioactive materials that have been within the city or the port since June 12, 1984.

"There's obviously a few things falling through the cracks," Willis said.

"What we're hoping is that council is still interested in the enforcement of their own bylaw."

"Our real concern when you boil it right down is we don't want to see any uranium shipments."

Willis called the position "supply-side disarmament."

Assistant city manager Ken Dobell, however, said he does not think his office is missing information about shipments of nuclear material.

The fire chief has not indicated any concern with the procedures for reporting the transport of radioactive materials through Vancouver, Dobell said.

Dobell said uranium that remains on board a ship in Vancouver's harbor is out of the city's jurisdiction.

Ald. Bruce Eriksen said the bylaw's impact is limited because the city has no jurisdiction over the harbor, which is under federal administration, and because it is difficult to determine whether nuclear materials will eventually be used in producing weapons.

"We may have to amend the bylaw," Eriksen said.

"The bylaw doesn't say 'if it could be used for weapons,' but that it's intended for that use."

CSO: 5120/21

ARGENTINA

ALFONSIN MESSAGE READ AT GENEVA CONFERENCE

PY130320 Buenos Aires LA PRENSA in Spanish 2 Aug 85 p 1

[Excerpts]

Geneva, 1 Aug (ANSA) -- In a message read at the UN disarmament conference here today, President Raul Alfonsin stressed the Argentine Government's interest in promoting peace and cooperation in Latin America. The message was read by Mario Campora, the new Argentine representative, after he was installed as president of the conference.

The president added: "This ambivalent aspect of science, which can be used for both peaceful and military purposes, has appeared with particular strength in the case of nuclear and space technology. The use of this technology may result in incalculable benefits for mankind or in a tragic situation, depending on whether it is used for peaceful or for military purposes. The statement signed by the U.S. and Soviet Governments on 8 January 1985 has awakened expectations that should not be allowed to die. We welcomed it with hope, and now we hope it will revive, emerging from the skeptical diatribe in which it has sunk. The Argentine people have made a considerable effort, within their possibilities, to reach higher scientific levels."

The president also said: "As for the nuclear issue, about which the disarmament conference is so legitimately concerned, my country will be a civil nuclear state. This decision was made by the Argentine people, who in the national elections voted for a party which maintains that nuclear energy must be used exclusively for peaceful purposes. Accordingly, and in order to clearly show the civilian nature of the Argentine Republic, we have imposed major reductions on our military spending."

CSO: 5100/2166

ARGENTINA

CNEA PRESIDENT VIEWS BUDGET CUTS, TLALTLOLCO

PY110356 Buenos Aires TELAM in Spanish 1229 GMT 10 Aug 85

[Text] Mar del Plata, 10 Aug (TELAM) -- Alberto Constantini, president of the National Atomic Energy Commission (CNEA), has repeated here that Argentina will not ratify the Tlaltelolco Treaty because it is discriminatory. He has also said the new economic policy has meant a considerable budget reduction for the CNEA. He explained, however, that an analysis of the budget cut shows that it preserves items that have a bearing on maintaining basic CNEA activities.

In an interview published today by the local morning paper LA CAPITAL, Constantini asserted that CNEA expenditure levels on personnel will be maintained. Our experts and scientists have enough funds to continue their activities without problems, and they will be paid adequately. He added that research, the intellectual standards of our scientists, and technology will be maintained at the same levels as before.

Constantini arrived here to attend the first meeting on social housing, organized by the General Pueyrredon township and Mar del Plata National University.

Constantini said public works was the item most affected by the budget cut. He mentioned that in public works, funds were planned for Atucha II, heavy water, and other projects, such as enriched uranium, the processing plant, and some laboratory projects of less importance.

He added: The first two projects are causing the most concern because this year about \$250 million would have been required for Atucha II, and at least \$100 million for heavy water. That \$350 million has been reduced to \$130 million. This is a noticeable reduction, and the year is advancing with fewer months left in which to invest.

He added that for the rest of the year he could keep the two projects going, but without significant progress.

Constantini said the problem is not serious this year. He then pointed out that the important thing is the political decision to continue the project in the future. He stressed: In this political situation, the president has said he will continue the project in the coming years.

Constantini said there is no longer a brain drain in the area of atomic energy. Most of the 13 nuclear physicists and 12 nuclear engineers who graduated in Argentina joined the CNEA, first on scholarships, then as employees, and finally at the plant.

Constantini said in conclusion that Argentina will not ratify the Tlaltelolco Treaty because it is discriminatory. The CNEA president explained that Argentina has taken this position because the treaty allows countries that are already armed to continue increasing and developing nuclear weapons, while it advocates the prohibiting unarmed countries from developing in the atomic area.

ARGENTINA

BRIEFS

COSTANTINI ON NUCLEAR PROGRAM--National Commission for Atomic Energy [CNEA] Chairman Alberto Costantini has said the Sierra Pintada uranium mine in southern Mendoza Province is still active. This mine will not stop operating because without this mine, the CNEA would have to halt its nuclear power plants, he added. Concerning projects at the Atucha II power plant and the heavy water plant, Costantini said an effort is being made to implement a program that will allow us to complete those projects amid our current economic difficulties as soon as possible. Costantini made it clear that the delay in the projects is causing unproductive expenses that are truly alarming, expenses that are a considerable burden for the national economy, of course. Nevertheless, as far as personnel is concerned the nuclear program is being implemented, Costantini stressed. [Excerpt] [Buenos Aires Domestic Service in Spanish 1600 GMT 16 Aug 85 PY]

CSO: 5100/2166

BRAZIL

MINISTERS DENY SECRET RESEARCH ON ATOMIC BOMB

PY082110 Sao Paulo FOLHA DE SAO PAULO in Portuguese 3 Aug 85 p 4

[By Joao Batista Natali]

[Excerpts] On 2 August, from 1000 to 1700, President Jose Sarney visited the installations of the Aerospace Technology Center (CTA) in Sao Jose dos Campos, 89 km from Sao Paulo. During the visit, two ministers who accompanied the president, Air Force Minister Lieutenant Brigadier Octavio Julio Moreira Lima, 58, and Science and Technology Minister Renato Archer, 63, emphatically denied that components for a Brazilian atomic bomb are being researched at the CTA's Advanced Studies Institute (IEAV).

The installations of the IEAV, the abbreviation by which the institute is known, are permanently guarded by tight security. Forty-eight journalists covering the presidential visit were barred from entering the institute. Nearly a year ago, a bimonthly war material magazine reported indications that secret research at the IEAV was partly directed at building an atomic bomb. The present as well as former governments have repeatedly stated that any nuclear projects under way are intended for essentially civilian and peaceful ends.

Air Force Minister Moreira Lima said it is only normal for Brazil to carry out some secret research involving lasers and new materials be at the IEAV to protect it against industrial espionage, because that research has to do with advanced technology.

CSO: 5100/2163

BRAZIL

FAILURES IN NUCLEAR PROGRAM CONTRACTED WITH FRG EXAMINED

Hamburg DER SPIEGEL in German 15 Jul 85 pp 95, 96, 98

[Text] The program was colossal and the uproar about it correspondingly huge: Brazil was to become a world power--with the help of German nuclear technology. Inexpensive electricity from atomic reactors--many dreamed of 60 piles--would assure an economic upturn. By the year 2000, the Brazilians would have control of the entire fuel cycle and along with it the skill to build a bomb.

That was 10 years ago in June, when the German-Brazilian atomic contract was signed, a "work of the century," as the Brazilian press celebrated it. But the hangover quickly followed the celebration.

After 10 years, the German atomic project for Brazil has still not given the country one single kilowatt hour of electricity. The Angra 2 reactor, the first atomic pile begun by the Siemens subsidiary Kraftwerk Union (KWU) [Power Plant Union], is still far from completion; excavations for Angra 3 have not even been made.

"Quantitatively," confesses Licinio Seabra, head of the national atomic firm Nuclebras, "we have not attained the goals of the atomic contract." That is putting it mildly--the contract has brought the Brazilians next to nothing. They played for high stakes, bet everything on the KWU card and lost.

The Brazilians' money for expensive prestige projects ran out long ago. Delays due to technical difficulties and sloppy planning delayed expansion of nuclear energy and thus drove costs high. The first civilian government since the 1964 military coup, in office for 4 months now, is turning away from the world-power dreams of the military men and hopes to accustom the heavily indebted country to savings.

Therefore President Jose Sarney has also put the brakes on the atomic program. For the time being, money is only available for two reactors: the Angra 1 turn-key power plant delivered by Westinghouse, still not functioning satisfactorily, and the KWU Angra 2 reactor. No additional nuclear power plant is to be begun for now.

"The Brazilian atomic program," explained Minister of Mines and Energy Aureliano Chaves on the anniversary of the German-Brazilian contract, "cannot continue at the pace at which it was planned. The country's condition does not permit that."

The condition of their country was of little interest to the generals who forced Brazil down the road toward becoming an atomic power 10 years ago. They wanted to buy a complete fuel cycle--nuclear technology as a package deal--and to obtain along with it know how to build a bomb.

KWU was prepared to deliver complete nuclear technology down to the reprocessing equipment for burned-up fuel elements. Eight atomic power plants of the "Biblis type," 1300 megawatts each, were to be built, plus a uranium enrichment facility as well as plants for manufacture of fuel elements and production of heavy reactor components.

The business interested the FRG in numerous respects. "In contrast to the United States, one of the great problems in Europe is that of primary national markets," Minister for Research Hans Matthoeffer had already written in the fourth Atomic Plan (1973-1976). The sales region between the Rhine and the Elbe was too limited for the atomic industry. It was also necessary to sell KWU power plants overseas. In addition, the contract with Brazil was to guarantee the German industry access to uranium.

Brazil has spent a good \$4 billion so far for atomic cooperation. Another \$1.8 billion is needed before the two reactors on the coast of Itaorna (Indian for "stinking stone") near Angra dos Reis can be operational.

The national atomic holding company Nuclebras is virtually bankrupt with debts of \$2.4 billion; high interest rates make matters worse. "It has always been rather expensive to be poor," jokes KWU spokesman Wolfgang Breyer in Rio de Janeiro.

The results of the German technology transfer are depressing:

- By 1992 at best only one reactor will be on-line;
- the fuel element factory built in Resende is only an assembly plant, dependent on deliveries from the FRG and Argentina;
- the Nuclep plant built in 1980, which manufactures heavy building components, is operating at only 30 percent of capacity;
- the reprocessing facility so far exists only in blue prints;
- there are no plans at all for atomic waste disposal.

The Brazilians are particularly embittered about the fact that they obviously selected the wrong technology in one crucial aspect: they are still not in a position to enrich the uranium for the pressurized water reactor, as KWU had promised.

Enrichment is in any case a costly physical process. But the (Trennduesen) process developed by professor Erwin Willy Becker is the most expensive of all the known techniques--and the most unreliable.

Originally, the plan was to build a facility within 5 years at a cost of \$300 million to deliver uranium enriched to 3 percent for fuel. However, the first stage of a plant which will enrich uranium to 0.9 percent at best will begin operation only next year. This first stage alone will cost \$300 million.

"The atomic contract was only good for the Germans," contends Sylvio de Aguiar Pupo, spokesman for an industrial association of manufacturers of reactor parts. Industrials, scientists and technologists in Brazil have, for a long time, not merely been concerned about the constantly rising costs and the meager results of the atomic program: above all, they fear that their country took the wrong road.

"These past 10 years," says physicist Jose Zatz, "have been totally wasted for us." Instead of buying expensive nuclear technology from the Germans, Brazil should have gone its own way developing energy saving techniques using amply available water power.

According to the physicist, "The small waterfalls in the state of Sao Paulo alone have a 2000 megawatt potential." The national electric authority, Eletrobras, estimates Brazil's hydroelectric power reserves today at 213,000 megawatts--as much as 164 KWU reactors would provide.

Atomic high technology in Brazil, where it once was celebrated as the shining path into the industrial future, has not given convincing proof of results. Technologists and economists have long been concerned with this crucial question: Do we really need all this?

Opponents of the atomic program like former Nuclebras manager Joaquim Francisco de Carvalho have calculated that the decisive specifications for this program were not valid: there is no way that the demand for electricity will climb as steeply as assumed.

Even today KWU continues to believe in an enormous increase in electrical consumption. "In Brazil, only 1100 kilowatt hours of electricity are consumed annually per capita," calculates KWU spokesman Breyer. "In the FRG it is 5600 and in the United States 9300. And each year Brazil's population increases by 3 million people." According to Carvalho, such figures should not simply be extrapolated. "That is the logic of the seller who wants to unload his equipment. Actually energy conservation is one of the most important activities today."

The engineer, currently employed by the Sao Paulo electric power company (CESP), also claims to be able to prove this. When energy was still inexpensive and seemed to be in oversupply, electrical consumption in the industrialized countries grew faster than the economy. But, since the end of the seventies, things are different--more is produced with relatively less electricity.

"Why should we waste as much energy as the Americans?" asks Carvalho. "With comparable per capita income, the Swiss get by with 30 percent less electricity."

Carvalho counters the sales oriented projections of the atom lobby with his own calculations: if the Brazilians wanted to reach a per capita income of \$3,250 by the year 2000, their economy would have to grow by 6 percent annually. If electric consumption rose, following current trends, from approximately 30 percent of the total energy consumption to around 40 percent by the year 2000, barely 498 million megawatt hours would be consumed.

This estimate from Carvalho is still somewhat higher than the demand calculated by Electrobras, yet far below potential hydroelectric power production of 933 million megawatt hours annually. Carvalho's conclusion: atomic power plants are out of place in Brazil at least until well past the turn of the century. Power lines to bring electricity from existing hydroelectric power plants to the large cities of the southeast as well as into the Rio/Sao Paulo/Belo Horizonte industrial triangle are far cheaper than reactors.

Even the construction of new hydroelectric power plants is more cost effective than new atomic piles. One of the least expensive of the current hydroelectric power plants was built at a cost of only \$370 per megawatt of output, and the expensive gigantic plant at Itaipu came to \$1000 per megawatt. But, according to Electrobras, the atomic reactor on the coast of the Stinking Stone will be three times as expensive. Taking into account both operating and investment costs, a hydroelectric power plant delivers electricity at \$0.017 per kilowatt hour on the average, while, in contrast, atomic electricity costs \$0.058.

But the critics of the nuclear contract go even further, attacking where its major justification would seem to lie. "We got nothing but technology which we do not need at all," complains physicist Jose Goldemberg, head of the electric power company CESP. "The concept of technology transfer," adds Carvalho, "is completely meaningless in the trade relationship between developing countries and industrialized nations."

Technology cannot simply be sold like some product, it is grown into slowly, Carvalho insists. "Germany gained experience over 70 years in the construction of coal fired power plants. Thus it was possible to master the technology of nuclear power plants, to take charge and to continue development."

On the other hand, KWU insists that its extensive program, presupposing years of cooperation with Brazilian engineers and technologists, gradually gives the purchaser the capability to have control of the production process.

Brazilian scientists dispute even this. At best, the purchaser could learn KWU technology. However, this excludes an independent nuclear science program with the potential for going its own way.

"As far as that goes, research in the area of atomic energy was always quite advanced in our country," claims Goldemberg. Before the war a large number of highly qualified scientists came to Brazil fleeing the fascists. "In the fifties we were working on particle acceleration and were beginning construction of small research reactors."

Brazilian aircraft builders have shown the right way to a certain extent: they created, based on various research programs, a national industry which can compete in the current world market (SPIEGEL 28/1985). Parts that they could not develop on their own are purchased elsewhere.

Brazilian scientists, set back in their research 10 years ago by the KWU contract, point with anger to the lead of Argentina, which, thanks to its own efforts, now has control of the complete fuel cycle. "Only in recent years has our Atomic Energy Commission had the purpose of fostering the development of national atomic research," states Goldemberg. "And this is our real nuclear program."

While the former atomic research siding is now clearly becoming the main track, the FRG company is falling deeper and deeper into bankruptcy. "If we had unlimited resources, we would only be finished by 1991/92 at the earliest," estimates Kurt Friedrich, building site manager for the first KWU reactor at Angra. "But we don't yet know whether we'll have anything to work with next year."

According to KWU spokesman Breyer, the technology transfer will only go through if further building follows Angra 2. Nevertheless, the crisis plagued German atomic firm is feeling the attraction of the world market along with the rest of the company.

Technology transfer is no one-way street, says Breyer. "We are making the Brazilians the offer of also participating in delivery to third markets. As an engineering firm, KWU is interested in having additional suppliers."

That, in fact, is the only way to explain the network of atomic contracts in the middle of which KWU stands. Thus a Peking contract with Brasilia followed on the heels of a German-Chinese atomic agreement. Breyer also sees possibilities in Egypt and in Turkey.

Critics of the German-Brazilian atomic contract give no sign of being impressed by such prospects either. In Carvalho's opinion, his country should concern itself with its own strengths and free itself from the shackles of the contract.

And Carvalho knows how that could be done: KWU should for example simply take over the heavy reactor parts plant that Brazil built for \$323 million--German banks could then settle the Nuclebras debts with an equivalent amount.

12666

CSO: 5100/2153

BRAZIL

ANGRA III SUSPENSION PROJECTED TO COST 40 BILLION CRUZEIROS

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 6 Jul 85 p 22

[Text] In the area of the Ministry of Mines and Energy it was proposed to President Jose Sarney that the Brazilian Nuclear Program be frozen, keeping only the Angra II Nuclear Powerplant--the first in the agreement with Germany--and halting constructions of the other powerplants, temporarily or for good, until 1988. These would be the Angra II and Iguape I and II powerplants in San Paulo.

Such a measure would mean a saving of 25.2 billion cruzeiros, taking into account the investments scheduled for this year: 48.8 billion cruzeiros in Angra III, and during the coming years until the other powerplants go into operation. Licinio Seabra, argues that if the Angra III project is halted this year, the cost for contractual indemnification will total 40 billion cruzeiros.

The committee for evaluating the state companies will also analyze the six hydroelectric powerplants, among which are Tucurui Phase II on the Tocantins River, and a thermoelectric plant, Rondino II. Of the six hydroelectric powerplants, four are in the Amazon Region and would represent plants replacing plants fueled by petroleum byproducts now producing electricity. Tucurui II is a separate case because if it were to be built without interruption, the final cost of a generated kilowatt by this powerplant would be among the lowest in the world. If the project were to be halted and the installations dismantled, they argue, not only would costs increase but the minimum time for renewing work would also increase.

In case the budget for the Itaipu Binational delays the rate of installation of the next turbines, as everything indicates is going to happen in 1 or more years, consumers of power in the Southeast will begin to feel the effects of such shortages beginning next year in the form of rationing and sudden interruptions in current.

The nuclear powerplant Angra II is already considered of a priority nature because it will go into operation as of 1991, when all the 12.6 million kilowatts of Itaipu are completely absorbed by the market. This is also the dilemma of the work on hydroelectric powerplants, which will be delayed or

deferred by ELECTROBRAS [Brazilian Power Companies, Inc] by the beginning of next year. With respect to PETROBRAS, according to the minister of mines and energy, the reduction in investments is going to diminish its capacity for investment in research and reduce its capabilities for adding new petroleum reserves and increasing national petroleum production in the future.

8908

CSO: 5100/2144

BRAZIL

SETUBAL TO DISCUSS NUCLEAR, SPACE COOPERATION WITH INDIA

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 13 Jul 85 p 24

[Text] The national scientific community is preparing the launching of Brazil into the international scene as a technology-producing nation with the image of an emerging economic power capable of carrying out excellent bilateral exchanges of production techniques in the modern sectors of telecommunications, data processing, microelectronics, advanced chemistry, food production and biotechnology. It will mean long work of public relations, marketing and, above all, an enormous domestic effort by scientists and the government. However, the first step is already being taken jointly by the Ministries of Foreign Affairs and Science and Technology, which are planning to begin a review some of the bilateral scientific cooperation agreements in this half of the year.

The still incipient idea is that of Renato Archer, Minister of Science and Technology, who 2 weeks ago returned from a trip to France and Japan where he concluded political agreements of technological cooperation. Next week it is the turn of Minister of Foreign Relations Olavo Setubal to spend some days in India negotiating some more agreements for cooperation in the area of data processing, atomic energy and space and marine resources research with the government of Rajiv Gandhi. Marketing work could still begin this year, with the participation of Brazil in the ambitious "Eureka Project" thought up by France to keep in Europe the brains that are migrating to the United States, contracted for the Ronald Reagan project "Star Wars."

Up to now only a review of the agreement with France has been agreed upon, however, the bilateral technical committee have not yet sat down to decide the sectors in which investments are to be made. Brazil has 49 agreements on scientific cooperation with 29 countries (30 with India), but very few of them produce any actual technological advance. The majority of them were signed throughout the years as a show of political good will; others are the so-called "one-handed" contracts in which only one partner has something to offer. For example, the two agreements with the United States for Brazilian educators, doctors and agronomists are more for them to learn with the Americans with the approval of the National Research Council (CNPq), while the agreements with Mozambique, Guinea, Surinam and Bolivia provide for bringing professionals from those countries to do research in Brazilian universities.

Agreements with countries of a similar technological development, such as Belgium, Argentina and Mexico, simply never functioned. There is also the

case of agreement with the Vatican signed 5 March this year--a week before President Figueiredo turned over the Presidency--at the request of the Pontifical Academy of Sciences' president, Professor Carlos Chagas, for Brazilian researchers to participate in international encounters sponsored by that body.

8908

CSO: 5100/2144

MEXICO

BRIEFS

LEAK BLAMED ON MERCURY--It is very probable that the failure of the Triga reactors, at the Salazar nuclear center, was caused by the drop in small quantities of mercury, a material which, together with water, significantly influences the recovery of aluminum from the reactor pool and which could cause a radioactive leak, according to a statement from SUTIN (Sole Trade Union of Nuclear Industry Workers). According to SUTIN workers employed at the nuclear center, a five-member technical committee, headed by Juan Ramon Mota Aguilar, chief of the reactor unit, was established "but the reason for the water leak from the pool has not yet been found." It was commented unofficially at the nuclear center that this group of technicians is quite worried because, very probably, "the failure was caused by the drop in quantities of mercury, a material which, together with water, significantly influenced the recovery of aluminum from the reactor pool." The SUTIN announced that water is being immediately drawn from the reactor in an effort to try to locate the possible leak. [Excerpt] [Mexico City EXCELSIOR in Spanish 21 May 85 pp 5-A, 9-A] 5058

CSO: 5100/2150

PERU

IPEN ASKS AUTHORIZATION FOR FOREIGN CREDITS FOR EQUIPMENT

Lima EL COMERCIO in Spanish 19 Jul 85 p A-8

[Text] In order to complete the construction and equipment of the Huarangal nuclear center, the Peruvian Institute of Nuclear Energy (IPEN) needs the approval of legal measures to enable it to obtain \$13 million abroad.

The president of IPEN, General Juan Barreda Delgado, said that authorization of foreign borrowing is being studied by the Joint Budget Committee and that final approval must be given by the Permanent Committee of Congress.

The president of IPEN said that the legal measures are not yet being approved because of "administrative and procedural problems," but he said he hopes that this will be solved soon in order to complete a work of great benefit to the country. The National Development Bank of Argentina has a commitment to the external financing and is working in close coordination in the matter with the National Bank of Peru.

The financing agreement stipulates that Peru is obligated to make a matching commitment of 6 million sols, to be disbursed within 2 years.

On completion the project will have required an investment of \$100 million, General Barreda Delgado said. He added that at present construction work is 90 percent complete and equipment about 70 percent complete.

Inestimable Development Possibilities

Completion of the project, which includes installing a zero power nuclear reactor, is of great importance for Peru, since it opens up unforeseeable possibilities for the development of new applications in the fields of agriculture, stockraising and medicine, among others.

These remarks were made yesterday by General Barreda Delgado on completing the signing of an agreement with La Molina National Agrarian University by means of which IPEN and that institution of higher learning commit themselves to united efforts in making better use of nuclear research.

One of the principal objectives of the agreement is to foment scientific-technological cooperation between both institutions in order to disseminate knowledge of applied nuclear science to the farming sector.

At the same time it is intended to promote research work and supporting activities in the different branches of nuclear and agronomic sciences that are of mutual interest. Furthermore, to exchange and transfer scientific-technological information of common interest.

12856

CSO: 5100/2147

PERU

GOVERNMENT SUPPORTS NUCLEAR-FREE ZONE PROPOSAL

PY201757 Paris AFP in Spanish 0238 GMT 20 Aug 85

[Text] Lima, 19 Aug (AFP) — The Peruvian Foreign Ministry today announced that Peru supports the proposal declaring the South Pacific area a nuclear-free zone.

The Foreign Ministry has stated that the Peruvian Government is pleased at and supports the agreement reached by the member countries of the forum on the South Pacific area, which met in Rarotonga, Cook Islands, on 5 and 6 August, to sign a treaty declaring the area a nuclear-free zone and stated its wishes that the implementation of this initiative be facilitated by the powers possessing nuclear weapons.

In addition, the Foreign Ministry recalled that in the past Peru has rejected the nuclear tests carried out in the South Pacific and expressed its concern over the consequences such tests have on the ecological balance and the human environment.

In Rarotonga, the heads of state of 14 area countries (Australia, New Zealand, Papua-New Guinea, Fiji, Western Samoa, Tonga, Solomon Islands, Vanuatu, Nauru, Niue, Tuvalu, Kiribati, Cook Islands, and Micronesia) agreed not to possess, test, or use nuclear weapons. In addition, they agreed to ask France, Great Britain, and the United States, which possess territories in the region, and the PRC and the Soviet Union to respect the proposed treaty.

CSO: 5100/2167

URUGUAY

UNIVERSITY COUNCIL RELEASES CIN DIRECTOR MUJICA FROM POST

Montevideo LA MANANA in Spanish 5 Jul 85 p 11

[Text] It was just learned that chemical engineer Hector J. Mujica has left as director of the CIN [Nuclear Research Center] by decision of the Central University Council.

Chemical engineer Mujica took that position in 1974. He was selected based on merit according to the agreement signed in 1968 between the Universidad de la Republica and the National Commission for Atomic Energy.

In 1975 the CIN directorate completely revised the project with the aid of its specialized technical personnel trained in different branches of nuclear technology with experience acquired abroad. It gave priority to completion of the laboratories to heat cells and mark molecules and the radiochemical laboratory which, along with other installations, were equipped in 1976.

Other construction projects were completed later. These included 11 laboratories, the first nuclear reactor for research in the country and general services like electrical and mechanical shops, maintenance and disposal.

Education, one of the objectives of the CIN, is being carried out as planned. Even research and development of nuclear technology have been carried out in different areas. Valuable collaboration has been given to state institutions and even private enterprises that have benefitted from the advanced technology achieved by highly qualified personnel.

7717
CSO: 5100/2141

EGYPT

BRIEFS

FIRST URANIUM MINE OPERATIONAL--Cairo, 11 Aug (MENA)--Egypt's first uranium mine will go into operation at a cost of 1.8 million pounds. Three additional shafts are being opened in the eastern desert to determine the size of uranium deposits there. Uranium has already been discovered in Aswan and in the northern desert. This element is a necessary component of nuclear fuel for the new facility in Al-Dab'ah. In today's edition, AL-AHRAM reveals that an aerial search for uranium will be conducted on the basis of measured radioactivity and magnetism. The Air Force will participate in this as well. This is part of a larger plan approved by 'Abd al-Hadi Qandil, minister of petroleum and mineral resources. The purpose of the program is to search for material that may be used in nuclear projects. [Text] [Cairo MENA in Arabic 0630 GMT 11 Aug 85]

CSO: 5100/4612

INDIA

RAJIV: INDIA PREPARES TO MEET PAKISTAN NUCLEAR THREAT

Calcutta THE STATESMAN in English 26 Jul 85 p 1

[Text] NEW DELHI, July 25--The Prime Minister said in the Rajya Sabha today that India was preparing to meet the threat posed by Pakistan's reported nuclear programme, reports UNI. Replying to a question by Mr S. Satyanarayana Reddy whether India was taking any steps in this direction, Mr Gandhi said: We are."

Asked if India had drawn the attention of the United States to Pakistan's acquisition of nuclear capability, the Prime Minister answered in the affirmative. He added that "we are strong enough to stand on our own two feet" and the attention of the United States was only being drawn to the nuclear technology being leaked to Pakistan through the United States or some other countries.

Mr Gandhi said it was not just a question of drawing the attention of the United States to Pakistan's acquisition of nuclear technology, but there were other "irritants" and India had to divert its funds to counter these weapons.

He said the U.S. Administration had assured him during his recent visit to that country that it would take action to stop any leakage of nuclear technology to Pakistan. The U.S. decision to stop the supply of Hawkeye aircraft to Pakistan was "an action in the positive direction", irrespective of whether it was a result of his visit or not, he said.

Mr Gandhi said he had raised the issue of the Pakistan-China axis in the matter of nuclear capability and had been assured by the U.S. Government that India's concern would be kept in mind.

The Prime Minister said the question of China supplying nuclear technology to Pakistan had come to the notice of the Indian Government, but the details were not known. If the International Atomic Energy Agency could be armed with sufficient safeguards to deal with such matters, it would be a matter of great satisfaction, he said.

In reply to the main question, the Minister of State for External Affairs, Mr Khurshed Alam Khan, assured the House that the U.S. Government had been informed that this kind of capability by Pakistan would set off an arms race in the subcontinent.

He said President Reagan had assured India that his government was "doing all it could to discourage it, as also nuclear proliferation in the whole region."

Replying to supplementaries, Mr Khan said China had already said it was not arming Pakistan. When his attention was drawn to reports of Pakistan's claims that it was 25 years ahead of India in the matter of uranium enrichment, the Minister said Pakistan was welcome to have its illusions. But, India was aware of what was happening, he added.

CSO: 5150/0047

INDIA

CAUTION URGED ON 'NUCLEAR RACE' WITH PAKISTAN

BK230940 Delhi THE INDIAN EXPRESS in English 12 Aug 85 p 6

[Editorial: "Lessons From Dhruva"]

[Text] Dhruva, the new 100 MW research reactor built entirely with indigenous know-how and equipment, is a landmark in more ways than one. It once again demonstrates the very considerable capabilities acquired by Indian scientists and engineers, notwithstanding the fact that the project has run well behind schedule. Dhruva has a role in both peace and, potentially, in war. Official media have highlighted its ability to produce new isotopes of medical, agricultural and industrial value like iodine 131, chromium 51 and molybdenum 99. But nobody would build such a large reactor just for producing isotopes. Dhruva will also yield very substantial quantities of plutonium which can be used in fast breeder reactors (FBR) to generate electricity. Indeed, a test FBR is already under construction in Madras.

The plutonium produced by Dhruva will not be subject to any international safeguards and can therefore also be used for military purposes if necessary. Plutonium from Dhruva will not be contaminated by the isotope plutonium 240, as is the case with plutonium generated in nuclear power stations like Tarapur. If Pakistan goes nuclear, it will be a simple matter for India to convert this plutonium into bombs. Pakistan has insisted that its nuclear programme is only for peaceful purposes. But it has no commercial use at all for the highly enriched uranium it is trying to produce at Kahuta.

One Pakistani scientist has talked about Pakistan being decades ahead of India in uranium enrichment (and by implication in producing bomb-grade material). It needs to be said that Dhruva's plutonium production will be far larger than the enriched uranium that Kahuta can hope to produce. It would be a serious mistake for anyone in Pakistan to think that it can win a nuclear race. There are no winners in a nuclear race. Any hard evidence of a Pakistani nuclear capability — a nuclear explosion is not necessary — will elicit a response from India. Pakistan may be some way from achieving this capability, but as time passes the capability will come. The answer must therefore not be to have nuclear arsenals on both sides (even as both condemn the arsenals of the two superpowers). The two countries need to come to a nuclear understanding. Only that can ensure that reactors like Dhruva and Pakistan's facility at Kahuta are used for peace; not war.

INDIA

REACTOR'S CRITICALITY SAID A 'MESSAGE TO PAKISTAN'

BK150726 Delhi THE HINDUSTAN TIMES in English 10 Aug 85 p 9

[Editorial: "Dhruva and Defence"]

[Text] Even as External Affairs Minister Khurshid Alam Khan was assuring Parliament that India had no need of an external nuclear umbrella since it was not helpless as far as its security against Pakistan's atomic bomb was concerned, the news regarding India's largest reactor Dhruva becoming critical came from Bombay. The significance of the latter in the context of the Government's decision to keep its nuclear options open is not difficult to surmise and, one hopes, Zia and his trigger-happy nuclear scientists have not missed the appropriate message.

The 100-MW reactor, totally indigenous in design and fabrication, is twice as large as the Canadian-built "Cirus" reactor. While our scientists have been laying stress on how the reactor would help increase production of isotopes like iodine-131 and chromium-51, what should ring a bell in Islamabad is that with Dhruva becoming critical, India will soon have a new source of plutonium, the fuel not only for fast breeder reactors but also for producing the bomb. What is more, plutonium produced there will not be subject to safeguards unlike in the case of Tarapur or Kota. Plutonium is also produced in Cirus, but since this reactor is aging the new one will eventually take its place.

A sizeable supply of plutonium should ensure India that in the event of Zia flexing his muscles on the strength of the nuclear bomb, our scientists will not be found wanting in this basic ingredient. Dr Ramanna and his team of dedicated scientists have already shown that they have the necessary blast know-how, and the same team that was responsible for the Pokharan blast is involved in the operation of Dhruva. One does not have to read between the lines what this implies.

Perhaps too much ballyhoo on the part of our media and politicians at the time of the 1974 blast proved counter-productive to India in the long run. The Indian Government is not committing the same mistake again. It is working quietly to keep its nuclear powder dry. Reports that Prime Minister Rajiv Gandhi has given the green signal to Ramanna to go ahead with preparations for a deliverable nuclear bomb may not be wide of the mark, considering that our defence laboratories are going full steam ahead to test large rockets capable of carrying nuclear warheads. In the circumstances, it would be suicidal for Zia to assume that Pakistan could spring a surprise on New Delhi with the announcement of having nuclear arsenal. The meaning of Dhruva should be crystal clear. It is a double-edged weapon.

CSO: 5100/4776

INDIA

AEC CHAIRMAN RAMANA SPEAKS TO MADRAS PRESS CLUB

Madras THE HINDU in English 26 Jul 85 p 9

[Text]

MADRAS, July 25.

The second unit of the Madras Atomic Power Station (MAPS) at Kalpakkam is likely to become operational next month, according to Dr. Raja Ramanna, Chairman of the Atomic Energy Commission.

Speaking at the Madras Press Club, Dr. Raja Ramanna said that the unit would work much better than the first. "It is better designed and the kind of troubles we had in Rajasthan (atomic power station) and Tarapur (atomic power station) will not be there." The forthcoming units at Narora (U.P.) and Kakrapar (Gujarat) and Kalga (Karnataka) would be built in a similar fashion because the design of the 235 MW had been standardised.

He was confident that the transition to the 500 MW reactor size planned for the late 1990s would not be constrained by the problems on the nuclear side. "It was only a question of extrapolating from the existing, proven 235 MW reactor design." He anticipated some problems with regard to pumps, heat exchangers, generators—all on the conventional power generation side. But he hoped that these would be resolved by the time the 500 MW sets became operational in 11 years.

On the 10,000 MW generation programme planned during the next 15 years, Dr. Ramanna conceded that funds would be hard to come by. But he said it was imperative that the money be found to see this plan through, for the country's second priority after agriculture was power generation. The Department of Atomic Energy had sought Rs. 2,000 crores from the Planning Commission for the Seventh Plan. The department itself was capable of

generating its resources. Revenues from the sale of power and isotopes totalled Rs. 200 crores a year now and in the Seventh Plan as a whole, this was expected to rise to Rs. 1,400 crores. "We are a profit-making body and the money can be ploughed back," he said.

Nuclear energy cheaper: The cost of generat-

"Pakistan working hard"

MADRAS, July 25.

Dr. Raja Ramanna, Chairman of the Atomic Energy Commission said here today that though Pakistan had no nuclear reactor which required enriched uranium (used in the making of a bomb), "the fact is that Pakistan is trying to work on enrichment".

Scientists were saying that the uranium could be used for a bomb but the Pakistan President had said it would not be. "But all indications are they are working very hard" towards a bomb, he said while addressing the Madras Press Club.

Asked whether India could perfect a weapons delivery system, Dr. Ramanna said that given the strong defence research and development base, it could make one if it wanted to.

ing nuclear power was going up. Nevertheless, it was still cheaper than the energy produced by coal-fired thermal stations located even at the pitheads, he said.

He described as an "obsolete rumour" the charge that nuclear power generation was unsafe, that Western countries were going slow

on its expansion and that there were problems in disposing of the nuclear waste. Even in the West, nuclear energy had come to be acknowledged as the only stable, clean and safe source of energy. The U.S. which was now generating 80,000 MW of nuclear power planned to increase it to 120,000 MW by 1990. About 75 per cent of France's energy needs would be met by nuclear power stations by the year 2,000.

Waste storage no problem: As far as the question of waste disposal was concerned, Dr. Ramanna pointed out that the waste produced by all the nuclear power stations in the country could be stashed inside a small room.

On the other hand, hillocks of coal waste, which was also radioactive, were being created in States like Bihar.

Stating that the fast breeder reactors, which produced more fuel than they burnt, would be the key to meeting the energy needs of the next century, Dr. Ramanna disclosed that the fast breeder test reactor (FBTR) at Kalpakkam would be operating in a month or two. Very few countries were working on fast breeder reactors, he said.

Spin-offs: The development of various systems for the nuclear industry had provided substantial spin-offs, especially in metallurgy. For instance, India had become the third country in the world to produce beryllium, a hard but light metallic element.

Asked about the Russian offer to set up 440 MW nuclear reactors in India, Dr. Ramanna said that it was his personal opinion that India should build its own reactors, although there had been suggestions that the offer be accepted.

INDIA

MINISTER ISSUES STATEMENT ON PAKISTAN'S PLAN

BK081509 Delhi ISI Diplomatic Information Service in English 1442 GMT
8 Aug 85

[Text] The minister of state for external affairs had made a statement in the Rajya Sabha on 7th August on the situation arising out of Pakistan's attempt to develop a nuclear bomb. In a separate statement in the Lok Sabha on 8th August, the minister of state made the following statement:

"The non-peaceful dimension of Pakistan's nuclear programme has been a matter of concern for India. Contrary to the claims by Pakistan's leaders, available evidence and public statements by Pakistan scientists suggest that Pakistan has been pursuing the objective of acquiring the wherewithal to manufacture nuclear weapons. The government have also been concerned at the regrettable attitude of certain countries which have chosen to turn a blind eye to these moves by Pakistan which could only have the effect of encouraging it to go ahead in this direction.

"Reports which have appeared from time to time in the international media in this regard, particularly about the clandestine procurement of nuclear equipment and components by Pakistan, have reinforced our apprehensions. Of immediate relevance are the case of a Pakistani national who was caught in the process of smuggling krypton from the United States to Pakistan and the recent report by the ABC correspondent John Scali that Pakistan had carried out a nonnuclear explosion using kryptons of U.S. origin. While the U.S. State Department has been unforthcoming on the statement made by Scali, we hope that the United States, resulting from PM's [prime minister's] discussions with President Reagan, will exercise its influence to dissuade Pakistan from pursuing the course.

"Our concerns on this subject which have been conveyed on different occasions to the Government of Pakistan at various levels were reiterated during the recent visit of the foreign secretary of Pakistan.

"The government are concerned at the likelihood of Pakistan acquiring nuclear weapons which would result in a qualitative change in the security environment in our region. India remains committed to developing nuclear technology for peaceful purposes. However, we cannot but take into account these developments in our neighbourhood which have grave implications for our security. I wish to assure the House that the government have been keeping, and will continue to keep, a constant vigil on all developments having a bearing on the country's security."

INDIA

MOSCOW REPORTS OF PAKISTAN'S NUCLEAR PROGRESS NOTED

Bombay THE TIMES OF INDIA in English 26 Jul 85 p 1

[Article by K. N. Malik]

[Text]

LONDON, July 25. **PAKISTAN** is 25 years ahead of India in atomic field and capable of making five atom bombs a year, reports here in Moscow suggest.

This claim was made two days back by Dr. Abdul Qadar Khan, well-known Pakistani atomic scientist. His country was among seven nations which possessed uranium processing capability, he said.

A report published in a Soviet newspaper and quoted by Pakistani newspapers here yesterday, said Pakistan was capable of making five atom bombs a year.

It also said Pakistan was engaged in the manufacture of atom bombs with United States' encouragement and that besides supplying a reactor, the U.S. was making available massive aid for Pakistan's atomic programme.

The Soviet paper said Pakistan had secured from Holland a special kind of steel for the manufacture of centrifuges. It has also obtained a uranium processing plant from West Germany and some advanced equipment from France, Belgium and Switzerland. Pakistan has, thus, acquired all the equipment it needs for making atom bombs.

The paper alleged that Chinese nuclear scientists were helping Pakistani scientists at the Kahota nuclear facility.

Last week, India's foreign secretary, Mr. Romesh Bhandari, drew the attention of the British government to the help that Pakistan had got for its nuclear programme from some countries, notably the U.S. He said that if Western countries continued to encourage Pakistan to make the bomb, India would have to reconsider its decision to use nuclear energy only for peaceful purposes.

Earlier, the Prime Minister, Mr. Rajiv Gandhi, had conveyed India's concern on this issue to the U.S. and France. These two countries had assured India they had conveyed to

Pakistan their concern about it making the atom bomb.

British sources, however, said their country had accepted an assurance by Pakistan at the highest level that it was harnessing atomic energy only for peaceful purposes.

Britain, like other Western countries which possess nuclear capability, maintains that it would be better for both Pakistan and India to sign the treaty to submit their nuclear programmes to international scrutiny.

Both countries have, however, refused to sign the treaty on the plea that it only precluded developing countries from acquiring nuclear capability.

INDIA

PAKISTAN'S STAND TERMED 'ACT OF DECEPTION'

BK260614 New Delhi NATIONAL HERALD in English 18 Jul 85 p 7

[Editorial: "New Pak Postures"]

[Text] The timing of Krytron explosion by Pakistan is a rebuff to the United States coming so soon after American assurances to Prime Minister Rajiv Gandhi that Pakistan was far away from manufacturing nuclear weapons, and even if it went ahead with any such plans, Pakistan would lose arms aid. The Pakistani postures are as much a warning to our peace-loving country's security with far-reaching ramifications for the future of Indo-Pak relations. But irrespective of the prevarications of President Zia to camouflage his menacing nuclear designs and the meaningless bilateral talks which he had been dragging with India to gain time, his latest interview with an Arabic language magazine published from London tears apart the veil of his equivocation besides being embarrassing to the United States itself. Asserting the right of his country to make the bomb and accusing the United States of double standards for not stopping Israel and South Africa from going nuclear, President Zia has said that Pakistan would refuse to bow to any United States pressure on it to stop its nuclear plan.

In fact, in this nuclear game the United States instead of exercising any restraint on Pakistan has been helping it in dubious ways to acquire nuclear technology. Even before Pakistan possessed an atomic potential, it was provided with all the delivery system, radar devices and technical know-how and even those resorting to thievery were given easy access to stockpiles of nuclear items. Pakistan's assertion that it would change its position only if the nuclear non-proliferation treaty was implemented universally, underlines the fact that Pakistan's earlier denial regarding manufacture of nuclear weapons was an act of deception. The NPT signed in 1968 was only meant to protect the monopolistic rights of the nuclear potentiality of the five big powers. This was discriminatory to the developing nations. India did not sign it as she found it derogatory to her independent status but unilaterally declared her intention of using nuclear research only for peaceful purposes. Pakistan's latest postures, however, pose a direct threat to India compelling her to review the security perception pursued by her so far.

CSO: 5100/4768

INDIA

COMMENTATOR VIEWS PAKISTANI NUCLEAR THREAT

BK271435 Delhi General Overseas Service in English 1340 GMT 27 Jul 85

[S.K. Bhatt commentary: "Nuclear Threat From Pakistan"]

[Text] Not surprisingly, the threat of Pakistani nuclear bomb continues to cause concern in India. Questions are being repeatedly raised in both houses of Parliament, now in session in New Delhi. Outside it also, a kind of debate is going on so as to what India should do to counter this threat. The claims being made by the leading Pakistani nuclear scientist, Dr Abdul Qadir Khan, that his country is now 25 years ahead of India in nuclear technology add to this concern, although those who know about nuclear technology and about Dr Khan do not take his claims seriously.

One of the opposition parties, the Bharatiya Janata Party--BJP--has demanded that India should go nuclear to match the Pakistani nuclear weapons capability. When the issue came up during question time in the Rajya Sabha, the upper house of Parliament, 2 days ago, the prime minister, Mr Rajiv Gandhi, declared that India is preparing to meet the threat posed by Pakistan's capability. Mr Gandhi has been speaking of the threat in his interviews with Indian and foreign media.

This was also a major recurring theme of his pronouncements during his tour of several countries last month. In all the statements and replies to questions, the prime minister has maintained that Pakistan is on a verge of acquiring nuclear weapons capability. He had also discussed the issue with the American president in Washington. When the Pakistan foreign minister, Sahabzada Yaqub Khan, visited India early this month for the second session of the Indo-Pakistan Joint Commission, this issue came up during the Sahabzada's meeting with Mr Gankhi. The suave Pakistani leader maintained the known, on-the-record stand of his government that Pakistan does not have the bomb and is not making one. Unfortunately, all available indications are to the contrary.

Even the Americans are quite concerned about the race for a bomb that is going on in Pakistan. Some of the leading personalities in that country are even of the view that Pakistan is just past the post. They argue that Islamabad is postponing the test of its bomb in order not to jeopardize the massive military and economic aid it is getting from the United States. If they are true to their professions, the Americans will have to stop all aids to Pakistan the moment she goes nuclear.

Long before India exploded her nuclear device in 1974, the late Mr Zulfikar Ali Bhutto had talked of a need for a nuclear bomb being developed by his country. He wrote about it and spoke about it. Evidence has been collected that in 1972, Mr Bhutto, then president of Pakistan, gathered together the top scientists of his country and asked them to give him the bomb. Mr Bhutto gave a religious touch to Pakistan's nuclear ambition and was thus able to get several Muslim nations involved. Bhutto died at the gallows, but his philosophy and the ambition to give Pakistan a nuclear deterrent--as he called the bomb project--was avidly pursued by the successor government. It is this game of things with which people like Dr Abdul Qadir Khan, born in Bhopal in India, fit it. The evidence of Pakistan having started its bomb project ahead of India's explosion of a peaceful nuclear device goes to show that the Pakistani effort was independent of the Indian endeavor to develop nuclear energy for peaceful purposes.

Pakistan has every right to develop nuclear energy for the betterment of the lot of her people. She has able scientists, some of whom have gone abroad and settled there. But making a bomb between India and Pakistan, it should [be] in the peaceful uses like nuclear power to serve humanity and to relieve pain and hunger, not to destroy life and the civilization that man has built for the past several millennia. The nuclear race was initiated by the Western powers and the superpowers, but before long the developing nations were drawn into this game, which is prohibitively costly and destructive in consequences. India has been crying (?hoarse) for years that Pakistan should not resort to nuclear weapons development as that program could be aimed only at India. The motivations are her burning desire to be always one up on India and leadership of the Islamic world. But India's program has been peaceful. Neither Pakistan nor India can afford to devote their limited resources to development of nuclear weapons. The money could be better used for raising the living standards of the people. But if Pakistan goes and makes the bomb, India's options get narrowed.

CSO: 5100/4768

INDIA

NEW REACTOR SAID CAPABLE OF PRODUCING PLUTONIUM

Plutonium Production

HK081112 Hong Kong AFP in English 0905 GMT 8 Aug 85

[Text] New Delhi, Aug 7 (AFP) — A domestically-built nuclear research reactor in Bombay became capable of producing plutonium today, PRESS TRUST OF INDIA (PTI) said.

It said the reactor at the prestigious Bhabha Atomic Research Centre (BARC) would be used in industrial, agricultural, and medical research. International plutonium safeguards would not apply as the reactor was entirely domestically-built, PTI said.

The "Dhruva" reactor was a major producing facility of plutonium, the fuel for second generation fast breeder reactors. It went critical today, meaning it became able to produce plutonium, PTI said. India already has other plutonium making plants.

The plutonium was capable of being used for nuclear weapons, analysts said. India has none and officially opposes their existence in any nation.

P. Iyengar, director of the BARC, was quoted as saying that "Dhruva" was the sixth and largest reactor at the centre and that all its systems were designed, built, and commissioned indigenously.

Earlier the atomic department said the 100 megawatt reactor would be used for isotope production and engineering research. It was also equipped with instruments designed for neutron spectrometry.

The "Dhruva" is a heavy water-cooled and moderated natural uranium metal reactor. It is about 2.5 times larger than "Cirus," another important reactor at the centre built with Canadian help in 1963.

The BARC's atomic fuel division made the reactor's fuel and an electronic and instrumentation group of scientists made the con-

trol systems, Dr Iyengar was quoted as saying. Another division, headed by S.K. Mehta and A. Kakodkar, worked out the design.

"Dhruva" was one of the few high flux reactors in the world, PTI said. It would help produce isotopes like iodine-131, chromium-51 and molybdenum-99, demand for which has increased for use in medical diagnosis and therapy, Dr Iyengar said.

It would also help in producing isotopes like iodine-125, which is currently imported.

India also has several commercial nuclear power stations.

Delhi on Commissioning of Reactor

*BK081617 Delhi Domestic Service in English 1530 GMT
8 Aug 85*

[Text] The country's largest nuclear research reactor — Dhruva — was successfully commissioned at the Bhabha Atomic Research Center [BARC] in Bombay today. The 100-megawatt uranium-fueled reactor is the sixth research reactor in the country.

The director of BARC, Dr P.K. Iyengar, said the reactor will be of tremendous use for producing isotopes and useful for medical and industrial purposes. However, it will not produce electricity.

With the commissioning of Dhruva, the country will have a major facility producing plutonium, the fuel for the second generation of fast breeder reactor.

The prime minister in a message has congratulated the scientists of the Bhabha Atomic Research Center on the successful commissioning of the reactor.

CSO: 5100/4772

INDIA

MOVE FOR INDO-SRI LANKA NUCLEAR COOPERATION REPORTED

Calcutta THE STATESMAN in English 1 Aug 85 p 11

[Text] BOMBAY, July 31--Talks were held here yesterday between Dr Raja Ramanna, Chairman of the Atomic Energy Commission, and Prof Cyril Ponnampuruma, Scientific Advisor to the Sri Lankan President, Mr J.R. Jayewardene, for exploring the ways of cooperation between India and Sri Lanka in development of nuclear science.

Professor Ponnampuruma, who heads a six-member delegation to India, told reporters yesterday that the talks had been very useful. The Bhabha Atomic Research Centre here would be the model for development of nuclear energy in his country, he said.

The delegation will visit Delhi to hold further talks with the Centre in this regard. Professor Ponnampuruma's visit is a sequel to the visit by Dr Ramanna to Sri Lanka some time ago.

Professor Ponnampuruma, who visited the BARC yesterday, said that he had been impressed by the progress India had made in nuclear science. The BARC would prove to be the powerhouse for development of nuclear science in the Third World countries, he felt.

The Sri Lankan Government was restructuring its science policy and the Government there was trying to attract the Sri Lankan scientists settled abroad, Professor Ponnampuruma said.

The head of the Sri Lankan delegation said that while developing the new science strategy, he had adopted the policy of Homi Bhabha. His attempt would be to persuade the brilliant scientists to come together and a programme would be developed around them.

He was particularly interested in applying nuclear science to medicine, agriculture and food preservation.

CSO: 5150/0051

INDIA

PARLIAMENT MEMBERS SAID TO 'URGE' WEAPONS POSSESSION

BK080907 Delhi Domestic Service in English 0830 GMT 8 Aug 85

[Text] In the Lok Sabha, members urged the government to make a firm decision in the case of Pakistan acquiring nuclear capability. Taking part in the call/attention discussion, they said that Pakistan has almost made a nuclear bomb. The recent assertion by President Zia of Pakistan's right to manufacture a nuclear device has also added to the concern of our people.

Ruling out the alternative of India going in for a nuclear umbrella from another country and a reiteration of ethical and moral stand adopted till now, the members stressed that there should not be any vacillation or ambiguity in the government's policy. The members also urged that possession of nuclear weapons would be the best deterrent against any threat.

Moving the motion, Mr S.M. Bhattam, Telugu Desam, demanded that the government should bring out a white paper on the subject. Professor T.J. Curion, Congress-I, cautioned against relying on the assurance given by the American Administration that Pakistan will be prevented from making a nuclear bomb.

In his reply, [Minister of State for Foreign Affairs] Mr Khurshid Alam Khan reiterated that India is keeping its options open but declined to spell out the details in the interest of the country's security. Sharing the concern on the sentiments expressed by the members, he said Pakistan's nuclear program is not peaceful. There is a wide gap between what its leaders say and do. It also a fact that Pakistan is trying from various sources financial and technical assistance to carry out its nuclear program,

CSO: 5100/4772

INDIA

RADIATION FEARED AT RARE EARTHS PROCESSING PLANT

Calcutta THE TELEGRAPH in English 31 Jul 85 p 4

[Article by Binoo John]

[Text]

Cochin, July 30: Employees of Indian Rare Earths situated in the Ernakulam industrial belt have expressed the fear that radiation is affecting their health. Employees who have swellings on their bodies have been sent to Trivandrum Medical College for detailed tests, the results of which are awaited. Top officials of the company told The Telegraph that only about four cancer deaths have occurred in the last 10 years and there has been no proof to link those deaths to radiation.

Indian Rare Earths, under the atomic energy ministry, processes mainly monazite obtained from the mineral-rich seacoast of Kerala. From this monazite is obtained trisodium phosphate, rare earth chlorides and thorium concentrates. Thorium contains radioactive uranium in small quantities and most of it is sent to the atomic energy centre at Trombay.

According to the IRE officials, considerable care is taken to ensure that the employees are not exposed to radiation. The radiation count to which a human being can be exposed is 5 REM (the unit for measuring radioactivity). But for Rare Earth employees, 10 per cent of this (0.5) is fixed as the permissible limit.

Earlier, some of the thorium compounds used to be exported but after the discovery of its nuclear value, most of it is stored in the factory complex itself. After a process of radioactivity elimination, the waste compounds are packed in polythene-lined drums and put in cement casks and then dumped inside concrete trenches and sealed. Some employees allege that some of the waste radioactive material is left in the open.

All the employees working in the radioactive sections of the company have to wear the "film badge" which monitors the alpha, beta and gamma rays. This badge is periodically removed and checked by a division of the Bhabha Atomic Research Centre. Employees whose badge shows more than the limited dose of radioactivity are shifted from that section. This sort of shifting occurs frequently.

IRE officials feel that the recent outburst by the employees is only a ruse to get an exemption from the ESI scheme, in which medical facilities are limited. The company is willing to give all the employees special medical benefits, but Union government is unlikely to grant them exemption from the ESI scheme.

CSO: 5150/2050

INDIA

BRIEFS

URANIUM SEIZED IN RAID--New Delhi, Aug 6 (AFP)--Authorities in eastern India recovered at least five kilograms (11 pounds) of uranium and arrested a man in a raid over the weekend on a smuggling den, the PRESS TRUST OF INDIA (PTI) said today. PTI said police and customs agents recovered the uranium which was worth five million rupees (416,666 dollars) on the local market, in the town of Barauni in Bihar State. Further details on the seizure and arrest were not immediately available. Bihar, ruled by Prime Minister Rajiv Gandhi's Congress (I) Party, has a long international border with Nepal which is unmanned at many points, area experts said. India has large uranium deposits and mining efforts are under way. The state-owned Uranium Corporation of India (UCI) is engaged in exploration work in uranium-rich Bihar and Madhya Pradesh States, officials said. Last month, police in Bihar reportedly arrested two men who were allegedly trying to smuggle an unspecified quantity of uranium to Nepal. [Text] [HK060602 Hong Kong AFP in English 0522 GMT 6 Aug 85]

FRENCH NATIONAL HELD FOR SPYING--Madras, India, Aug 5 (AFP)--A French national has been arrested on suspicion of spying after being found in a prohibited area of an Indian atomic power station, police said here today. The man, identified as Bernard Sardrai, was arrested Saturday on suspicion that he was engaged in intelligence gathering near the Kalpakkam atomic power station near Mahabalipur, 60 kilometers (37 miles) from here, police said. He appeared in court the same day, and was remanded in custody for 15 days, they added. Central industrial security personnel said they found Mr. Sardrai behaving in a suspicious manner in the prohibited area surrounding the atomic power station, which is adjacent to India's fast breeder reactor research centre. He has admitted to being a French nation, but refused to give any further information about himself or what he was doing near an atomic power station, police said. Intelligence officers suspect that Mr. Sardrai was a spy trying to gather information about the Kalpakkam atomic power station, established with indigenous technology, and the progress India was making with its fast breeder reactor. [Text] [NC051900 Paris AFP in English 1841 GMT 5 Aug 85]

HEAVY WATER REQUIREMENTS--In another answer, Mr Patil said the requirement of funds for the heavy water programme during the seventh Plan has been assessed at Rs 1150 crore. The actual allocation is under discussion with the Planning Commission. [Text] [New Delhi PATRIOT in English 26 Jul 85 p 7]

RESOLUTION ON URANIUM INDUSTRY--The Lok Sabha unanimously passed a statutory resolution approving the government notification which declared uranium industry as an essential service. The minister of state for science and technology, Mr Shivraj Patil, who moved the resolution, said that the mines under the Uranium Corporation of India are the only source of the mineral in the country and these have to be protected. [Text] [Delhi Domestic Service in English 0240 GMT 20 Aug 85 BK]

COMMISSIONING OF REACTOR REPORTED--Dhruv--A 100-megawatt thermal research reactor designed and constructed at the Bhabha Atomic Research Center went critical at 0242 this morning. Dhruv is among the few large research reactors in the world. It will open new avenues for frontline research in nuclear physics, reactor materials, and development of fuel for (?fast) reactors. This will also boost the production of radioisotopes for use in medicine, industry, and agriculture. Dhruv is considered to be an important milestone in the nuclear energy program. [Text] [Delhi Domestic Service in English 0240 GMT 8 Aug 85]

MADRAS POWER PLANT COMMISSIONED--The second unit of the Madras atomic power plant is being commissioned today. The 235 megawatt unit is attaining criticality this afternoon. This has been announced by the nuclear power board. The unit using natural uranium as fuel and heavy water as moderator is indigenously designed and built. It incorporates certain improvements made over the first unit which also has the same capacity of 235 megawatt. Power production of the unit is expected to begin sometime in October after a series of tests. [Text] [Delhi Domestic Service in English 0730 GMT 12 Aug 85 BK]

CSO: 5100/4774

PAKISTAN

POLITICIAN COMMENTS ON ATOM BOMBS

GF101303 Lahore JANG in Urdu 5 Aug 85 p 1

[Text] Lahore--Mian Tufail Mohammad, the president of the defunct Jama'at-e Islami Party, has said that it was extreme cowardice on the part of the government not to make atom bombs despite the availability of all the components needed. In his special interview with a JANG correspondent, he said if Rajiv Gandhi can make bombs to destroy Pakistan, why should we not pay him in kind? He said that elected assemblies have come into power in the country, therefore, the government should openly announce that it will make atom bombs. He said it is not the monopoly of the United States, Soviet Union, France, India, and Israel to go into nuclear research. No superpower has the right to prevent other countries from carrying out research in this field. He said that people in the United States, Soviet Union, France, India and Israel have not dropped from the heavens that they should prevent us from making atom bombs for our own security. He added that if all the facilities are available to make an atom bomb then it is extreme cowardice on our part not to make one. He said that Pakistani rulers also should follow the example of Reagan, Gorbachev, Mitterrand, Thatcher, and Rajiv. Is it only the Muslims who are meant to be killed? Now when India has made a plan to destroy Kahuta, we should not sit silent. If Israel can destroy Iraqi nuclear installations, then this right should be availed of by Iraq also.

In regard to the Kashmir question, he said that it is a hopeful sign that the current regime has revived the question of Kashmir which had been put on hold. He said that the policies of the present regime in regard to Afghanistan and Kashmir are worth praising.

In regard to the situation at our borders he said that the attitude of India and the Soviet Union was a matter of great concern for us. It is only due to the patience and tolerance of Pakistan that the situation has not worsened on our borders. He said that India and the Soviet Union have left no stone unturned in trying to create a difficult situation on our borders. The Soviet Union has violated our borders several times through Afghanistan. The Indian attitude, on the other hand, has created a very dangerous situation on the Kashmir border.

CSO: 5100/4775

PAKISTAN

INDIA'S 'PROPAGANDA,' PLANS CRITICIZED

BK121421 Karachi Domestic Service in English 1715 GMT 11 Aug 85

[By Syed Shabbir Hussain]

[Text] Two simultaneous announcements made by India on 8 August disclosed India's augmentation of nuclear capability and the [words indistinct] refusal to make South Asia a nuclear free zone. The first announcement said that India now has the world's largest nuclear research reactor, which is capable of producing weapon-grade plutonium, and this reactor began operating on Thursday. According to India's Atomic Energy Department, this reactor has gone critical — a condition in which a chain nuclear reaction is maintained as a first (?process) before the production is to be started.

The 100-megawatt reactor, called Dhruva, is fueled by natural uranium, and the weapon-grade plutonium produced would not be subject to regulations of the International Atomic Energy Association.

The announcement made about the commissioning of the reactor was preceded by weeks and months of Indian propaganda that Pakistan's nuclear program was not peaceful nor was it exclusively intended to meet its energy requirements. Top leaders of India, including the prime minister, Mr Rajiv Gandhi, indulged in useless propaganda against Pakistan within and outside India. During his recent tour abroad, he did not hesitate in making these allegations even before those world leaders who knew that Pakistan had no such design. These allegations against a smaller neighbor were actually intended to keep India's own nuclear plan under cover and to build a case for the enhancement of its nuclear capability on which she was working since long.

The entire gamut of hatred and hostility against its neighbor was thus a camouflage for her own designs of speaking from a position of [words indistinct] strength and directing the course of events in the region as it desired. Announcing the commissioning of the reactor on Thursday, Dr Raja Ramanna said that it was a landmark in India's atomic energy program. The reactor, which is located at the Bhaba Atomic Research Center outside Bombay, was designed and built by Indian nuclear engineers. Dr Raja made it known to everybody that it would not be open to any outside inspection. The reason given by him was that since it was their own creation they would not let anybody have the right to

inspect it. The reactor would enable India to replace the device which produced the plutonium for India's first atomic explosion in May 1974.

Then simultaneously came another announcement by the Indian minister of state for foreign affairs that India was not interested in any dialogue with Pakistan about the possibility of making South Asia a nuclear-free zone. The minister of state Mr Khurshid Alam Khan told Lok Sabha that India's nuclear capabilities were demonstrated as far back as 1974. Rejecting the proposal for making the region a nuclear-free zone, he said that it was not possible to accept it, as in his view, certain countries of the region have already become nuclear. In fact, it is not these countries which have become nuclear, but it is only one country which is nuclear since 1974 and which has announced the commissioning of the largest reactor claimed to have been built by its own scientists.

In the same [words indistinct], the Indian minister poured out the usual venom against Pakistan which his prime minister has also been doing for the last 3 months. He said that the Indian Government possessed definite views about the option in the face of what he described as Pakistan's attempt to make a nuclear bomb. What did all this mean except that [words indistinct] nuclear 11 years ago and since it is engaged in a massive program of production of a nuclear weapon. Therefore, it could not talk about any proposal to make this region free from atomic weapons. India has all along rejected the proposal and refused to sign a nonproliferation treaty, and meanwhile has armed its forces to the teeth with conventional weapons. Now it has all of a sudden made it clear how far it has already gone in nuclear capability and what it can do with its capability to the other states in the region.

India has never been helpful in the evolution of a peaceful atomosphere in South Asia, but her latest advancement in nuclear capability and, at the same time, her refusal to consider any proposal to make the region nuclear free are bad omens for peace in the region and the much-needed economic development of the countries concerned.

CSO: 5100/4773

PAKISTAN

BRIEFS

PLANS FOR URANIUM--Karachi, 13 July--The government has formulated a plan for the vast uranium reserves in Dera Ghazi Khan. Informed sources have said that this important plan will be implemented shortly with national and foreign resources. Prospecting for uranium continues; 46 lakh rupees have already been spent on this project. The Dera Ghazi Khan project is estimated to cost 80.9 million, of which 10.7 million will be in the form of equipment and machinery procured from abroad. Raw uranium was discovered and is to be used to produce nuclear energy, the plan for which is now being implemented. [Text] [Lahore NAWA-E WAQT in Urdu 15 Jul 85 p 1 GF]

EQUIPMENT HANDLING SAID IMPROVED--The control and equipment systems handling capacity of the Karachi atomic energy plant has been further improved to help modernize and develop the computer and the control and equipment systems at the complex. The attainment of the skill to adeptly use the control and equipment panels has greatly helped in the running of the Karachi atomic energy plant despite the stoppage of assistance and cooperation by the country which had supplied the equipment and technology for this atomic plant. [Text] [Karachi Domestic Service in Urdu 0200 GMT 25 Aug 85]

DELEGATION TO ATTEND CONFERENCE--Pakistan will attend the third appraisal conference on nonproliferation of nuclear weapons scheduled to be held in Geneva as an observer. An official spokesman said in Islamabad yesterday that although Pakistan is not a signatory to the Nuclear Nonproliferation Treaty for reasons known to everyone, Pakistan has adhered to the basic objective of the treaty and has neither produced a nuclear weapon nor acquired one from elsewhere. He said Pakistan's decision to attend the appraisal conference for the first time reflects its continued support for the basic objective of the treaty. The spokesman added that Pakistan is in favor of effective, nondiscriminatory arrangements for the nonproliferation of nuclear weapons at regional and global levels. The spokesman recalled that Pakistan had supported the ratification of the treaty by the UN General Assembly in 1968. However, it did not attend the first and second appraisal conferences in 1975 and 1980. [Text] [Karachi Domestic Service in Urdu 0200 GMT 26 Aug 85]

CSO: 5100/4779

SOUTH AFRICA

STORY BEHIND SHUTDOWN OF KOEBERG INVESTIGATED

Comparison with France's Plants

Johannesburg THE SUNDAY STAR in English 21 Jul 85 p 6

[Text] NUCLEAR power stations in France contain the same faults which prompted a safety shutdown at Cape Town's Koeberg plant. But, unlike South Africa, the French did not shut down their plants.

The disclosure came after an investigation by The Sunday Star into the causes of the nuclear shutdown in South Africa.

The French decision to carry on with power generation at nuclear plants may explain the strong condemnation of South Africa's decision to shut down Koeberg from the French nuclear contractors Framatome, say scientific observers.

French engineers say their faults--carbon copies of those at Koeberg affecting stainless-steel pipes--are of no concern.

The Sunday Star has learnt that an undisclosed number of power stations in France contain stainless-steel fittings made from the same Swedish rogue ingots which prompted Escom's worldwide investigation.

The stainless-steel ingots contained imperfections which Escom believed could threaten Koeberg. One affected pipe was found in a vital emergency system which would be used to stabilise the nuclear reactor if an accident occurred.

An Escom spokesman said it was inappropriate to comment on the French situation but a spokesman for the French contractors confirmed that the faults found in France were in the same emergency system as the one which prompted the Koeberg shutdown.

The French operators and Framatome had discussed the "ferritic inclusions" found in stainless-steel components of Koeberg's reactors 1 and 2 and recognised that French nuclear power stations might be affected.

The operators told the Nuclear Safety Authority on March 25, 1985: "A careful study of the file causes us to confirm the position expressed on March 12,

1985, namely that the nature and the configuration of the anomalies do not provide a reason to question the integrity of the affected components.

"In the hypothetical case where an inclusion would come up to the surface of the internal wall, its dissolution might lead to fatigue damage which would, however, remain limited and could never lead to a sudden failure of the components concerned."

France depends on nuclear power for about half of its electricity demand, soon to increase to about 70 percent.

Escom, worried about the safety of Koeberg, ordered the shutdown in January this year. In February Framatome issued a statement condemning the move.

It said: "Framatome, supplier of the Koeberg nuclear island equipment, wishes to make known its disapproval."

Framatome said that only one pipe elbow on Koeberg reactor 2 had been replaced and scientific investigations had shown that the "ferritic inclusion" in the pipe did not represent a risk to the safety of the plant and, consequently, this elbow could have been left in place.

"Against Framatome advice, Koeberg reactor 1 has been shut down for investigation. In the light of French experience on 37 similar units in operation, this decision appears to be an over-reaction which unduly spreads doubts on the quality and safety of the installation."

No other defects existed which could be detrimental to the plant.

"Framatome confirms its initial recommendations which best combine the safety of the units and their economics."

Framatome said:

- Reactor 1 should be put back in operation;

- Laboratory investigations should be continued on samples taken from reactor 2;

- Reactor 2's commissioning should resume;

- If investigations showed the unlikely existence of other "non-conformances" which could cause concern in the long term, the necessary replacements should take place during normal future shutdowns of the plant.

A statement issued by Escom at the same time said: "We, as far as nuclear power is concerned, set some of the most stringent safety standards in the world. Escom, economic factors notwithstanding, has decided to shut down the reactor."

Escom felt the iron particles in the stainless-steel pipes could deteriorate after a few years' service as a result of corrosion.

"It may be said that we are over-reacting and that this costs money, but Escom has never considered safety to be negotiable--our operating figures illustrate this," said the Escom statement.

Mr Herbert Berger, joint managing director of Industrial Machinery Supplies, Framatome's agent in South Africa, said nuclear energy was new to South Africa and he assumed the Atomic Energy Corporation and Escom did not want to take any course that could undermine public confidence in nuclear power.

South Africa had taken a positive, thorough, conservative approach but the French had decided that their affected plants could operate safely until routine shutdowns were made.

Mr Berger confirmed that iron particles had been found in stainless-steel pipes during the construction phase of several nuclear stations in France.

"They have been found in exactly the same system which affected Koeberg."

Escom's extensive investigations had been valuable to Framatome.

Investigation Detailed

Johannesburg THE SUNDAY STAR in English 21 Jul 85 p 6

[Text]

SMALL metal tags, worth a few cents each, knocked out the R3 000-million Koeberg nuclear power station and triggered the most expensive piece of detective work in South African history.

Troubleshooters from Escom travelled around the world in a R6-million investigation to find out what had caused the dramatic shutdown of the country's first nuclear power station.

Working against the clock, teams of investigators in Johannesburg, Cape Town and Paris studied thousands of documents, conducted scientific tests and examined many kilometres of pipes to ensure that Koeberg would be operational for the winter months.

Without Koeberg, a continuous electricity supply in South Africa could have broken down last week when Escom recorded the highest demand —

17 853 MW — in its 63-year history.

Investigators discovered and rectified two faults in Koeberg's systems and traced how they had occurred just in time. Escom was granted permission to bring the twin-reactor station back into the national grid with one reactor in time for the higher winter demand.

But The Sunday Star has now uncovered the full story behind the shutdown and has followed the frenzied sequence of developments at Escom.

Investigators travelled to the United States, Canada, Japan, Britain, France, Sweden, West Germany and Italy to solve the riddle.

They eventually found that mild-steel identification tags in stainless-steel ingots and produced by a Swedish company in 1978 had caused the nuclear alert.

Part of the tags — pieces of flat bar — had been left in the ingots when they were shipped to Italy to be rolled and made into stainless-steel pipes. A

batch of about 50 ingots from the Swedish plant was affected. It is not clear how other ingots were used.

But the "ferrite inclusions" in stainless-steel pipes at Koeberg were seen by Escom as serious enough to close the station until a series of thorough checks had been carried out.

Experts found a second pipe elbow was also affected by a rogue inclusion. Both pieces of pipe were replaced.

Ironically, the fault was first found on a pipe that Escom technicians hope will never have to be used. The pipe is part of an emergency system which would carry water laced with boric acid into the second reactor chamber to stabilise the nuclear reaction in the event of an accident.

The second fault was found on a less vital system.

Mr Peter Spencer, Escom's manager (nuclear), explained how an investigations network had been established.

He said: "Colleagues in the test and research department at Rosherville were involved in initial explorations to find the ferrite inclusions.

"Others at Rosherville were analysing the pipes in the testing programme.

"Nuclear engineers at Megawatt Park were concerned with the various systems that could be affected and investigated the safety of the systems.

"Teams of two or three--two teams at Megawatt and three at Rosherville--were reviewing the strength of the pipes. How seriously was Koeberg affected?

"Then there were investigations by project teams at Koeberg who examined component packages and removed endless lagging from pipes.

"Meanwhile, in Paris, our quality-assurance people were liaising directly with contractors overseas. It was urgent work. We did lots of overtime.

"Our crash overseas programme was launched when it became clear the licensing authorities here wished us to assure them no other manufacturer could have caused similar problems.

"We had four teams of two in Europe, two in America and one in Japan. They had three weeks of interviews and visits to steelmakers to see at first hand the manufacturing processes.

"Our investigators found that the practice of using these marking tags was not unique to the Swedish plant, but that it was a practice used in the steel industry worldwide over a long period.

"Where manufacturers used this process, their material had to be checked."

But the series of checks, counter-checks, analyses and worldwide investigation had left Koeberg one of the safest nuclear stations in the world, said Mr Spencer.



How the fault started (above) and how it ended up in the stainless steel pipes (below).



Scarred Pipes Described

Johannesburg THE SUNDAY STAR in English 21 Jul 85 p 6

[Article by Steve McQuillan]

[Text] ROUTINE pre-commissioning inspections on the second reactor at Koeberg nuclear power station on November 3, 1982, uncovered a mystery that sent scientists scurrying for their alibis.

A stainless-steel elbow pipe 15 cm wide was scarred on the outside and no one knew what had caused it.

The pipe was part of a vital safety injection system that would automatically release water laced with boric acid into the primary cooling system of the nuclear reactor should there be an accident.

The fluid would stabilise the system and, combined with several other safety operations, could prevent a "China Syndrome" disaster should a failure occur within the nuclear containment dome.

Escom pointed out the mystery scars to the French contractors, Framatome, who decided to shelve the problem and concentrate on the commissioning of reactor 1.

By 1984, the scars were still a mystery. Framatome did not explain what they were but said they were of no concern, according to Mr Peter Spencer, Escom's manager (nuclear).

"The mark was clearly visible on the outside of the pipe. We told the contractors that if they would not investigate, we would. We could not accept that this was of no concern.

"We said if it was only a scratch, let's grind it off. We did. We ground the metal down to the minimum bore thickness and still the mark remained. We again told the contractors that it was not satisfactory."

Escom scientists dug out a sample of the trapped metal. They found that the particles were ferritic inclusions, or iron particles.

Later examinations showed that the marks were flat strips of variable length, 10 mm to 12 mm wide and 0.4 mm thick.

Says an Escom report: "As the inclusions were suspected to be of manufacturing origin, Escom identified the manufacturer and requested details of the manufacturing process from its quality-assurance personnel in Paris.

"They are responsible for implementing Escom's quality-assurance programme on the contractor's design, procurement, man-

ufacturing and transportation activities in Europe."

On January 15 this year Escom was told by the Atomic Energy Corporation that the problem had to be solved before it would issue a licence for reactor 2 to go critical. Escom also had to show that the problem did not affect systems used in the first reactor as well.

During the following few days three facts emerged from Escom's investigations which led to the shutdown of reactor 1 and the delay in commissioning of reactor 2.

The information came from Escom's Paris staff after a visit to the Italian manufacturer who had supplied the scarred pipe elbows.

Escom was told on January 19 that:

- The embedded metal could not have been introduced during the manufacturing process in Italy.

- During a routine inspection at the manufacturer a ferritic inclusion in an elbow had been traced back to the steelmaker in Sweden who was responsible for the manufacture of the stainless steel.

The inquiry at that time — 1979 — proved that the inclusion had been caused by a non-alloyed marking tag, introduced during the casting of ingots at the Swedish factory.

- As a result, suspected elbows from heat LK 7525 (creation of an alloy) were recalled, inspected and some rejected. The rejected elbows had been manufactured a short time before the suspect Koeberg elbow containing the scars was manufactured from a different heat, LK 7296.

The day after, Escom learnt that not only were there five elbows from the same batch in reactor 2, but there were 38 elbows from the same batch in reactor 1. Engineers feared that the affected pipes might crack or corrode.

On the same day Escom met the AEC. The day after, Escom decided to shut down reactor 1 for inspection and to delay criticality on reactor 2.

Engineers immediately set about identifying all potentially affected parts.

"The heat numbers were important," said Escom's report. "Escom's quality-assur-

ance staff in Paris visited Sweden on January 25 and 26."

The practice of using tags on ingots was stopped in September 1979. Ecom identified and later inspected all potentially affected parts at Koeberg.

But the AEC expressed concern after Ecom had presented its initial safety case in March this year that other parts, not supplied by the Italian manufacturer, could be affected in the same way.

The AEC directed that all stainless-steel components from all manufacturers, and all suppliers of raw stainless steel should be investigated.

The decision triggered an extensive, worldwide investigation into stainless-steel identification practices which started in April and finished in June.

In 1978 investigators found ingots from a single heat only, LK 7525, were involved. But the Koeberg pipes were from LK 7525 and LK 7296, indicating other heats could be affected.

The faults were caused by identification tags on stainless-steel ingots which had been accidentally rolled into components.

After their worldwide investigations, Ecom teams found no evidence to suggest that ingot identification practices could have caused a problem similar to the one which had occurred in Sweden.

Scientists also concluded that the inclusions could not affect the pipes' hardness and strength.

"The only possible unacceptable characteristic of an inclusion would be its corrosion resistance," said the Ecom report. "Corrosion is only of concern in those inclusions which penetrate the inner surface."

The contractors and Ecom agreed that it was unlikely that the inclusions had penetrated the inner surface of pipes. But if they did and were dissolved by corrosion, they would not crack during their intended life span.

Said the report: "It is therefore an acceptable risk to operate both units."

Ecom and Framatome, the main contractor, are now negotiating over who will pick up the bill for the cost of the shutdown.

"There are ongoing negotiations between Ecom and the contractor about the settlement of costs," said Mr Spencer.

SOUTH AFRICA

NUCOR SHELVES SECRET CAPE PROJECT

Johannesburg THE STAR in English 10 Aug 85 p 3

[Text]

A large new multimillion-rand nuclear installation on a rocky Cape south coast site near Albertinia has been put on ice for some five years because the Nuclear Development Corporation is short of funds.

Only insiders at the corporation's head office know exactly what the mysterious seaside complex, known as the Gouriqua project, will be used for.

Dr Wynand de Villiers, executive chairman of the Atomic Energy Corporation, the umbrella body controlling Nucor, said in Pretoria that suggestions that the Cape nuclear complex would be connected with the manufacture of nuclear fuel elements and the reprocessing of the uranium 235 fission element were not necessarily correct.

"We still have to determine what the Cape complex will be used for but it should eventually employ between 300

and 400 people. The fact is that our site at Pelindaba has become too small for Nucor's expansion."

In a letter to Meason, organ of the Institute of Physics, Dr de Villiers says the Gouriqua research project "will cost a lot of money and will require a number of highly-trained scientists to run it". The project had to be delayed for five years because the State-funded nuclear industry "had to accept severe cutbacks", he said.

There have been some protests by environmentalists over the Gouriqua plan, named after an important Khoi tribe which lived in the area in the 18th century.

One of the protestors, Dr E H Schumann, oceanographer at the University of Port Elizabeth, said there hadn't been enough debate on whether South Africa needed the Gouriqua project during a time of financial hardship and shortage of physicists.

CSO: 5100/39

ZAIRE

COMMISSIONER DISCUSSES ATOMIC ENERGY RESEARCH

AB211703 Kinshasa AZAP in French 0930 GMT 21 Jun 85

[*"Exclusive"*] AZAP interview with Professor Malu wa Kalenga, general commissioner for atomic energy research, to mark the 25th anniversary of the Zairian General Commission for Atomic Energy — date and place of interview not given]

[Excerpts] Kinshasa, 21 Jun (AZAP) — [AZAP] Professor, Zaire will commemorate in a few days the 25th anniversary of its nuclear research. What lessons can be drawn from it?

[Malu] The lessons that can be drawn from it are many. The most important is that we should not be afraid of being ambitious in scientific and technical matters. In fact, despite the hazards due to the troubled period of 1960-65 and the economic crisis after 1973, the citizens of this country have shown that it is possible to master an advanced technology and to improve significantly the intricate working tool which an atomic reactor is.

[AZAP] Are you satisfied with the achievements made so far, citizen general commissioner?

[Malu] Certainly. This does not mean that we could not have done more and better. But in this field it is always necessary to make a "cost-benefit" analysis: what has been put into it and what we derive from it. The uncertain nature of research must also be taken into account. If one knew what was to be found, it would not be necessary to do research.

[AZAP] Nuclear research in Zaire is tied to the existence of the General Commission for Atomic Energy which later became the Regional Nuclear Energy Centre, (CREN-K). Public opinion is not well-informed about the existence of this center and its achievements. What is the actual situation?

[Malu] For example, we have built a new atomic reactor which is performing better than that which CREN-K inherited at the beginning. Note that I have said built and not ordered and had built. [Sentence as received] We have trained and put to work about 50 specialists of whom nearly 15 have a doctorate in highly specialized disciplines relating to peaceful applications of atomic energy. We have organized monograph-writing sessions for dozens of students from Zairian universities. We have organized several regional science courses for African research workers. And finally, the personnel of CREN-K and the associate research workers make use of nearly 350 publications and technical notes

in the most diverse sectors connected with the peaceful uses of atomic energy.

[AZAP] Your center is of course interested in development problems. In this regard, citizen general commissioner, what are the most remarkable results obtained in the field of Zaire's development, or for example in the fields of health and the well-being of the people?

[Malu] The answer depends on personal appreciation. As a scientist, any research crowned with success is an achievement in the framework of the development of a country because development does not have only a material significance. You have rightly stated this by using the word "well-being" which transcends material or quantifiable acquisitions. But of course to the average reader, material, or in any case quantifiable, acquisitions have a better appeal. Using these terms of reference, we can say:

A. In the field of agronomy, the development of new varieties of seed through radio-induced mutation. Concretely, we have developed and handed over two varieties of mutant groundnuts to the Department of Agriculture and Rural Development for multiplication and distribution. The center has also developed several new varieties of maize and a new variety of soya — which have not yet been distributed due to inadequate means of multiplication and some incidents like thefts in the farm — as well as two new varieties of rice which are under experiment at the National Institute of Agronomic Studies and Research (INERA)

B. As far as soil sciences is concerned, we have demonstrated the usefulness of phosphates in Bas-Zaïre where they are used in bulk as fertilizer. In addition, a functional soil-analysis laboratory is working to the great satisfaction of various clients: agriculturists, the FAO. Concerning the program for valorization of Zairian leguminous plants, a systematic study of legumes and leguminous plants has been in progress for several years to define their food value and the conditions under which they can be introduced into the eating habits of the people. Besides, the study of the water hyacinth has revealed that this plant presents interesting prospects for livestock feeding.

C. We are producing routinely isotopes and molecules marked in Technetium-99 M which are used in several fields, especially nuclear medicine. Added to this area are the radioimmunological kits.

D. In the medical field, radioactive tracer techniques are routinely used for diagnostic purposes for diseases as varied as goiter and cancer. Year in, year out, over 2,000 patients are treated by using scintigraphic exploration in the university clinics.

E. Finally, though without having been exhaustive, we may call attention to radiation control activities. It is an important activity since each hospital, for instance, has an x-ray machine. This type of equipment, emitters of rays, must be checked to ensure that they are used according to acceptable norms for the safety of the public and of nurses. These are some results which interest the general public. There are many others whose practical usefulness is less evident. Such is the case regarding the construction of a pulse research reactor which to date, is the most powerful in Africa.

[AZAP] Before finishing, professor, could you outline the prospects for the development of the activities of CREN-K in view of the results achieved so far?

[Malu] The prospects for development are many, particularly in agriculture, medicine, biology, and chemistry. It will take too long to detail them here. They are detailed in the 5-year plan of the atomic energy general commissioner. Besides, to be realistic, these prospects must be adapted to the material and human resources that can be mobilized for research and development in the nuclear field. Let us say that the main priority is to bring to a successful conclusion the construction program of a big unit for the production of radioelements and a major laboratory for the handling of hot substances which has been going on for almost 10 years now. This program is being developed particularly slowly, due to current financial constraints.

[AZAP] So, the final word, professor?

[Malu] I wish to end by expressing my greatest appreciation for the untiring efforts made by the Executive Council, and singularly by the guide of the Zairian revolution, to maintain the position of Zaire in this field which is not only prestigious, but particularly useful in the socioeconomic development of the republic.

CSO: 5100/38

FRANCE

COGEMA REPORTS IMPROVED INTERNATIONAL POSITION

Paris AFP SCIENCES in French 27 Jun 85 pp 53-55

[Text] COGEMA [General Nuclear Materials Company] registered a sustained growth in profits in 1984 and "is strengthening its international position in a highly competitive environment," emphasized its CEO Mr Francois de Wissocq, on 21 June at Velizy, near Paris.

The net profits of COGEMA, a wholly-owned subsidiary of the AEC [Atomic Energy Commission] increased 157 percent in 1984 to 154 million francs. According to Mr de Wissocq, "This improvement continued during the first months of 1985."

The combined profits of COGEMA and its subsidiaries totaled more than 500 million francs for 1984; however, methods used to compute depreciation and reserves differed from those adopted for the parent company alone, he specified.

COGEMA, whose activities run the gamut of the nuclear cycle, from uranium mining to enrichment to fuel production and reprocessing, posted gross revenues of 10.45 billion francs in 1984, down from the 1983 level (11.295 billion francs).

However, the total combined gross revenues of COGEMA and its subsidiaries in 1984 remained close to the 1983 level--approximately 17 billion francs. For 1985, Mr de Wissocq projects revenues of 20 billion francs.

In 1984, 40 percent of the revenues of COGEMA and its subsidiaries were earned abroad, "almost entirely in the dollar zone," stated Mr de Wissocq. COGEMA progressed primarily in Japan, where it is the leading French exporter with one fourth of French sales in this country, and in the United States (11 percent of its combined sales in 1984.)

"We believe we are the best or one of the best in the business," stated the CEO of COGEMA, which has supplied 112 nuclear reactors throughout the world (or 40 percent of existing reactors.) In 1984, COGEMA signed new contracts amounting to 5.5 billion francs, with 42 percent in the United States, 42 percent in Europe and 15 percent in the Far East.

The magnitude of its investments (4.4 billion francs for the group in 1984), makes COGEMA one of the leading French investment groups. In 1985, its investments should grow to approximately 5.5 billion francs due to the "growth phase" of the extension of the La Hague reprocessing plant site.

[Table]

COGEMA IN BRIEF

40 percent of gross revenues of COGEMA and its subsidiaries earned abroad.

Ranks 32nd among French exporters; No. 1 French exporter to Japan.

COGEMA and its subsidiaries represent 20 percent of world natural uranium capacity.

Between 35 and 40 percent of world production of enriched uranium produced by EURODIF in 1985.

Largest producer of Lithium 7 in the world (at Miramas).

80 percent of reprocessed oxide fuels in the world for 10 years.

New contracts signed in 1984: 5,500 million francs, with 42 percent in the United States, 42 percent in Europe and 16 percent in the Far East.

COGEMA's clients include 70 electricity producers worldwide.

As of the end of 1984, COGEMA had supplied 112 reactors throughout the world (or approximately 40 percent of all reactors).

COGEMA and its subsidiaries invested over 4,400 million francs in 1984: It is one of the major French investment groups.

Its self-financing capacity is nearly 20 percent of gross revenues.

Net profit of 154 million francs for COGEMA-COGINTER.

COGEMA's staff in 1985 includes over 9,500 employees, 14,500 for COGEMA and its subsidiaries combined.

[Table]

DISTRIBUTION OF CONSOLIDATED REVENUES BY ACTIVITY IN 1984

| | |
|------------------------|------------|
| Natural uranium | 31 percent |
| Enrichment | 43 percent |
| Reprocessing | 21 percent |
| Fuel and miscellaneous | 5 percent |

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CSO: 5100/2575

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